General Specifications

Item	Specification
Lubricants and Sealants	
Premium Long-Life Grease XG-1-C, K or T	ESA-M1C75-B
Threadlock and Sealer E0AZ-19554-AA	WSK-M2G351-A5
Black Non-Acid Cure Silicone Rubber E7TZ-19562-A	ESL-M4G273-A
Pipe Sealant with Teflon® D8AZ-19554-A	ESR-M18P7-A
Preload	
Input/output shaft preload	0.0 mm (in) - 0.05 mm (0.002 in)
Countershaft cluster gear preload	0.0 mm (in) - 0.05 mm (0.002 in)
Countershaft extension preload	0.05 mm (in) - 0.13 mm (0.005 in)
Fluid	
DEXRON III® (ATF) Transmission Fluid XT-2-QDX	DEXRON III®
Capacity	3.9 L (4.1 qt.)
Synchronizer	
Synchronizer blocking ring to conical face runout 1st, 2nd, 3rd, 4th, 5th & 6th gear	0.38 mm (0.01 in)
Synchronizer blocking ring to conical face runout Reverse gear	0.75 mm (0.03 in)

Torque Specifications

Description	Nm	lb-ft	lb-in
Transmission-to-clutch adapter housing bolts	35	26	—
Crossmember-to-frame bolts	41	30	—
Crossmember-to-transmission support bolts	58	43	—
OSS sensor bolt	10	—	7
Gearshift lever boot bolts	10	—	89
Lower gearshift lever bolts	20	15	—
Upper gearshift lever bolts	37	27	—
Shift dent	40	30	—
Shift lever guide bolts	27	20	—

Guide plate bolts	22	16	—
Reverse lockout solenoid bolt	18	13	—
Drain plug	27	20	—
Reversing lamp switch	27	20	—
Fill plug	27	20	—
Reverse idler shaft bracket bolts	25	18	—
Extension housing bolts	35	26	—
Shift dent cover bolts	20	15	—
Adapter plate plug	27	20	—

Manual Transmission

The T56 six-speed manual transmission features the following:

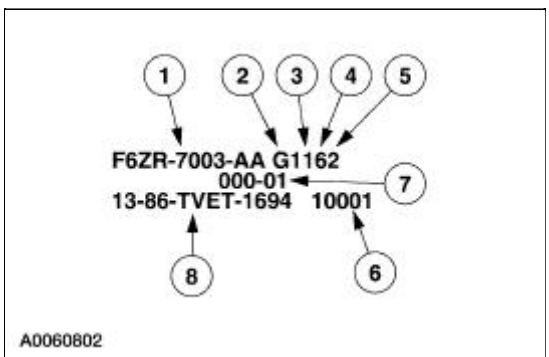
- six forward speeds and one reverse speed.
- forward gears are synchronized and helical cut.
- a reverse gear operates through a constant-mesh, fully synchronized system.
- a shift interlock system prevents the engagement of more than one gear.
- a countershaft with two sections, the countershaft cluster and the countershaft extension. The countershaft cluster is serviced as an assembly, the countershaft extension components are serviced.
- two tapered roller bearings on the output shaft.
- two tapered roller bearings on the countershaft cluster.
- a tapered roller bearing on the input shaft.
- a tapered roller bearing on the countershaft extension.
- countershaft cluster endplay controlled by shims located in the transmission adapter plate.
- countershaft extension endplay controlled by shims located in the extension housing.
- input/output shaft endplay is controlled by shims located in the transmission adapter plate.
- removable wear pads on the shift forks.
- an aluminum main case, extension housing, adapter plate and clutch housing.

Transmission Identification

The transmission identification tag is located under the lower bolt that retains the extension housing to the main case.

The six speed (T56) transmission is available for the Mustang 4.6L (4V).

Transmission Identification



Item	Part Number	Description
1	—	Transmission assembly number
2	—	Build date code — month

3	—	Build date code — day
4	—	Build date code — year
5	—	Shift number
6	—	Serial number
7	—	Service repair code
8	—	Identification number located on left lower side of transmission case

Manual Transmission

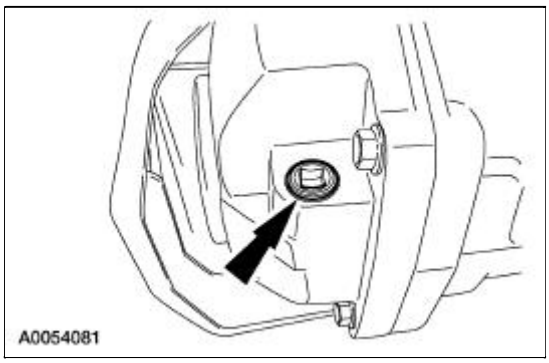
Refer to Section 308-00 .

Transmission Draining and Filling

Material

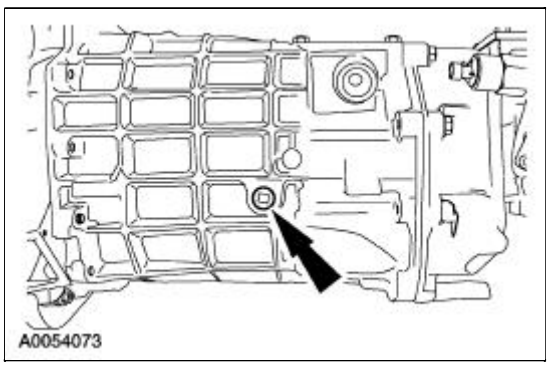
Item	Specification
DEXRON III® (ATF) Transmission Fluid XT-2-QDX	DEXRON III®

1. Remove the drain plug and drain the transmission.
   - Position a suitable drain pan under the transmission.

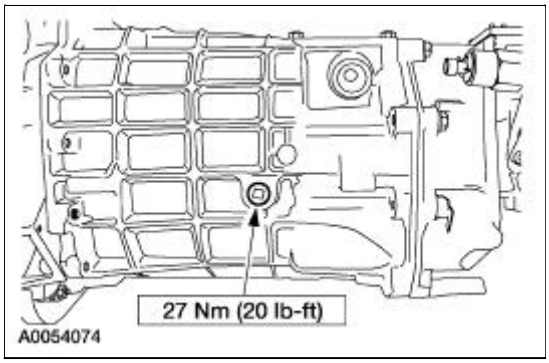


2. Clean and install the drain plug.
3. **NOTE:** Before removing, clean the area around the filler plug.

   Remove the filler plug.



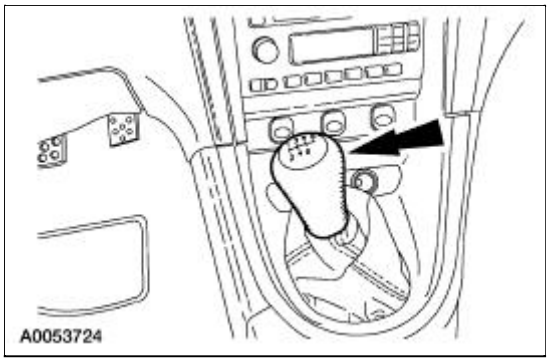
4. Using a suitable oil suction gun, fill the transmission to the correct level with the specified fluid.
   - Transmission capacity is 3.9 liters (4.1 quarts).



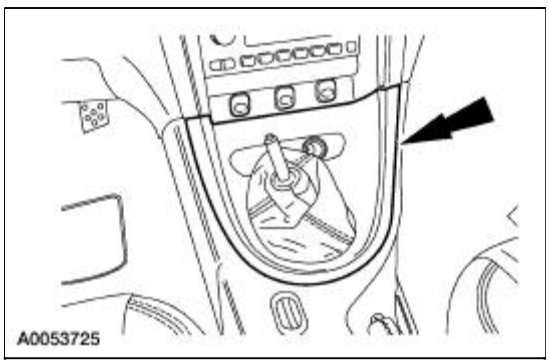
5. Install the filler plug.

Transmission

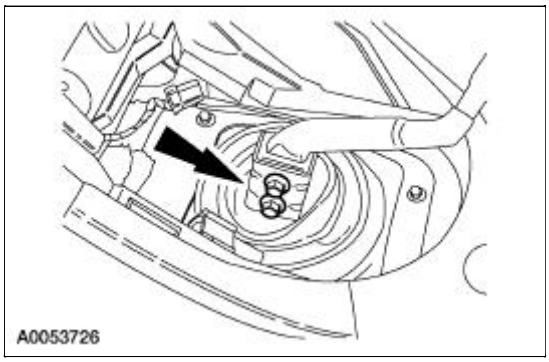
1. Remove the gearshift lever knob.



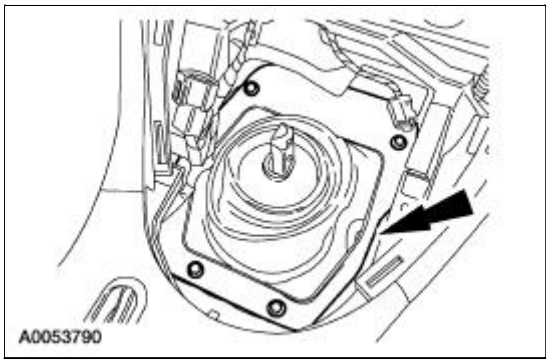
2. Remove the console panel gearshift plate. Disconnect the cigar lighter electrical connector, then lift the gearshift lever boot over the gearshift lever.



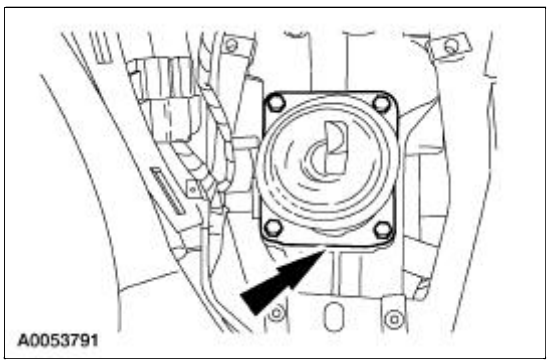
3. Remove the bolts and the upper gearshift lever.



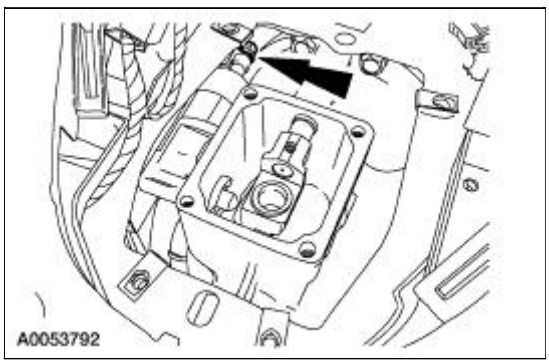
4. Remove the bolts and the lower gearshift lever boot.



5. Remove the bolts and the lower gearshift lever.

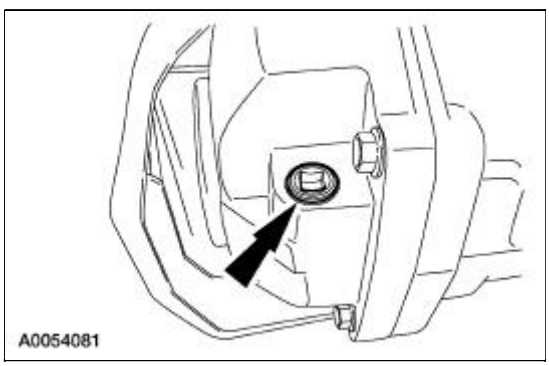


6. Disconnect the reverse lockout solenoid electrical connector.



7. With the vehicle in NEUTRAL, raise and support the vehicle. For additional information, refer to Section 100-02 .

8. Drain the transmission fluid.

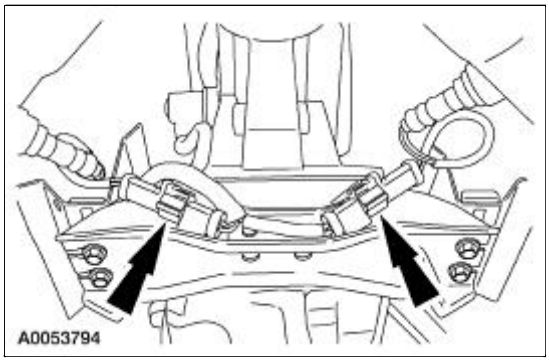


9. **CAUTION: Index-mark the driveshaft flange and pinion flange, and the driveshaft**

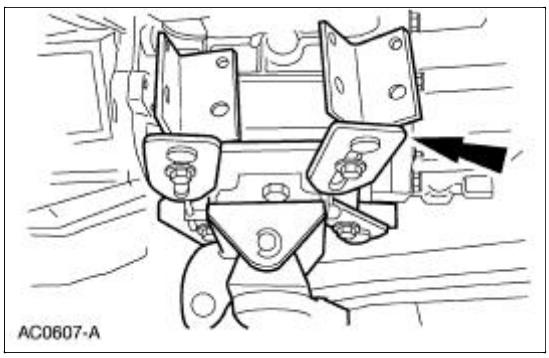
slip yoke and transmission output shaft.

Remove the driveshaft. For additional information, refer to Section 205-01 .

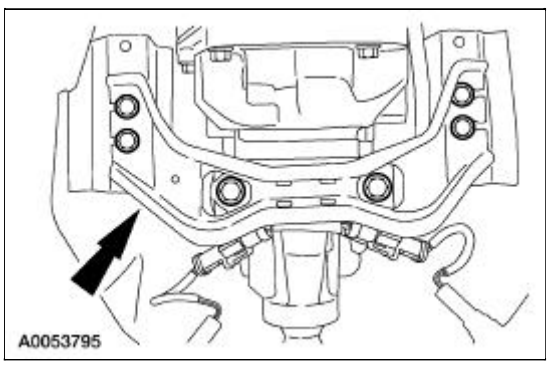
10. Disconnect the heated oxygen sensor (HO2S) electrical connectors from the crossmember.



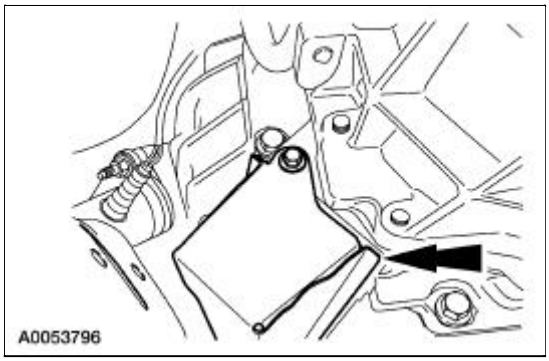
11. Position a transmission jack and support the transmission.



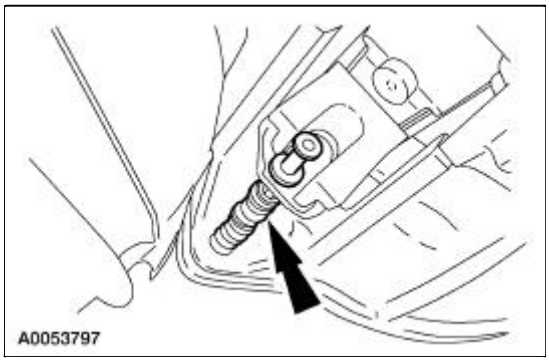
12. Remove the bolts and the transmission crossmember.



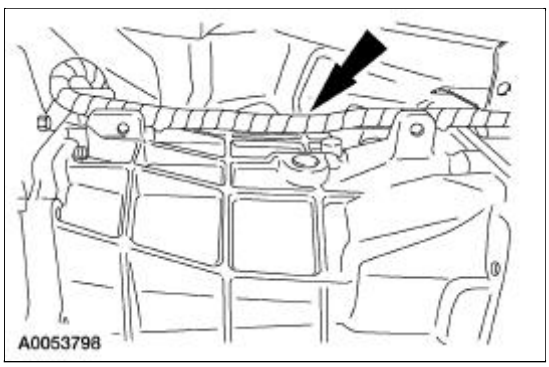
13. Remove the bolt and the clutch release lever cover.



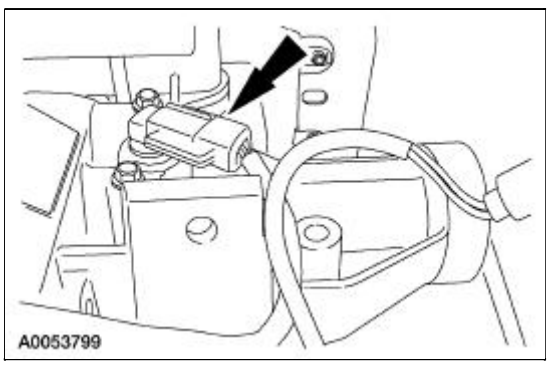
14. Disengage the clutch release cable from the clutch release fork.



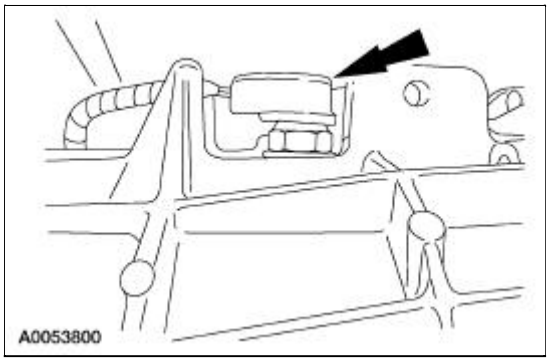
15. Disconnect the wiring harness from the transmission.



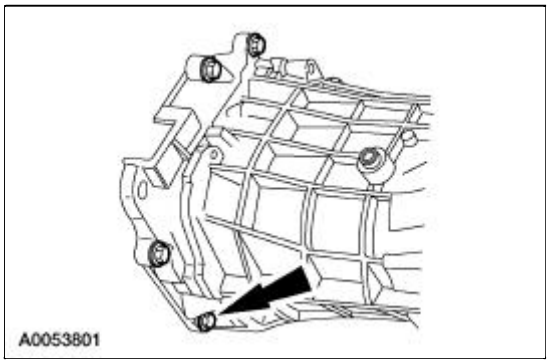
16. Disconnect the output shaft speed (OSS) sensor electrical connector.



17. Disconnect the reverse lamp electrical connector.



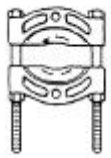
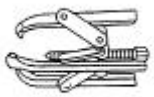
18. Remove the eight transmission-to-clutch adapter housing bolts.



19. Move the transmission rearward until the input shaft is clear of the pressure plate, then lower the rear of the transmission while moving it forward to clear the exhaust pipe. Lower the transmission from the vehicle.

Transmission

Special Tool(s)

ST1186-A	Holding Fixture, Transmission 307-003 (T57L-500-B)
 ST1368-A	Puller, Bearing 205-D064 (D84L-1123-A)
 ST1184-A	2 or 3 Jaw Puller 205-D027 (D80L-1013-A)
ST1305-A	Remover, Mainshaft Bearing 308-058 (T77J-7025-H)
ST2163-A	Remover/Installer, Bearing Tube 308-025 (T75L-7025-C)
ST1304-A	Removal Screw, Bearing Tube 308-092 (T84T-7025-B)

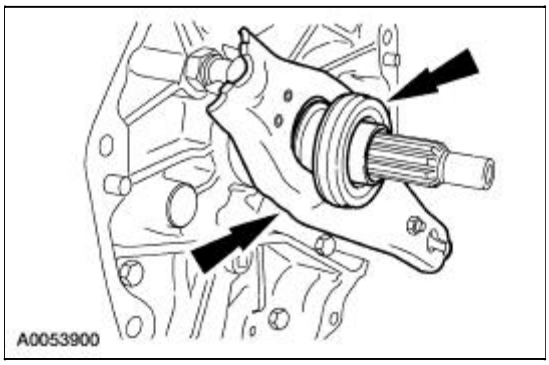
Disassembly

NOTE: During disassembly, if any roll pins, retaining rings or bearings are removed, install new components. Install bearings and bearing cups as a set only.

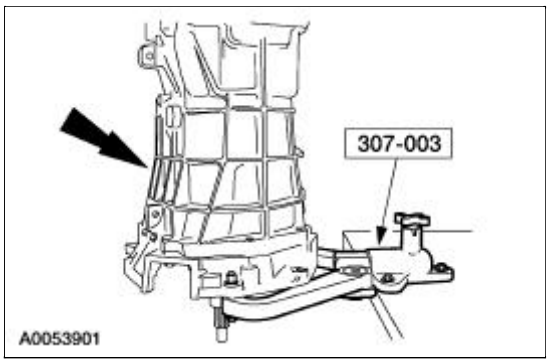
1. **WARNING: Make sure protective eye wear is in place.**

Clean the transmission exterior with solvent and dry with compressed air. During disassembly, clean all components with solvent and dry with compressed air.

2. Remove the clutch release hub and bearing and the clutch release lever.



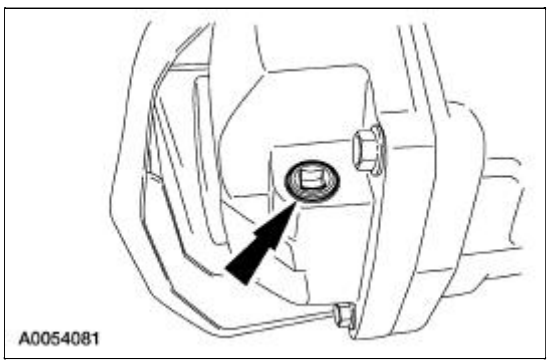
3. Attach the transmission to the special tool.



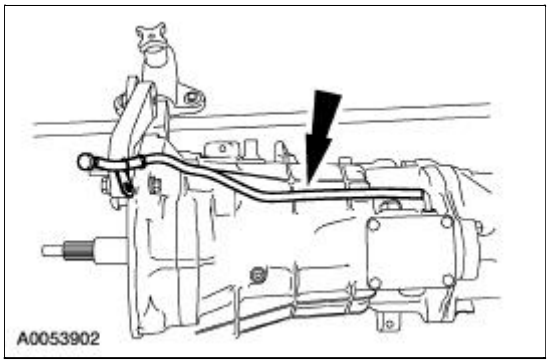
4. Rotate the transmission to a horizontal position.

5. **NOTE:** Position a drain pan under the transmission.

   If the transmission was not drained during removal, drain the transmission.



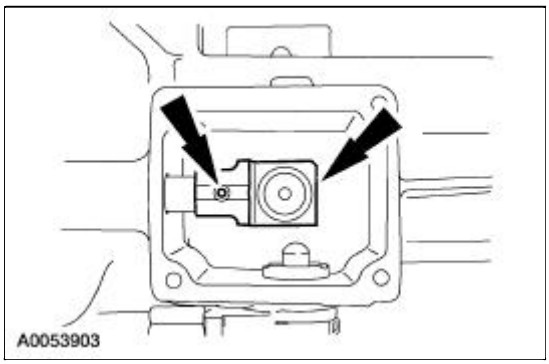
6. Remove the vent hose.



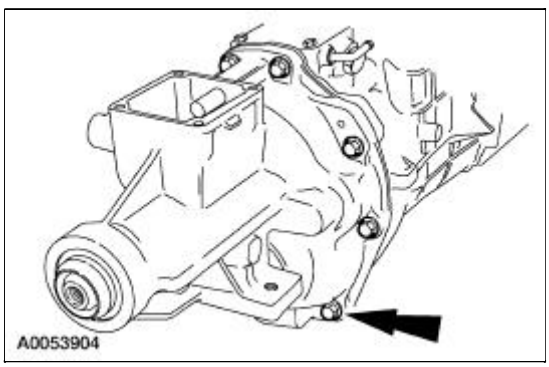
7. **NOTE:** Position the gearshift lever in third/fourth neutral position.

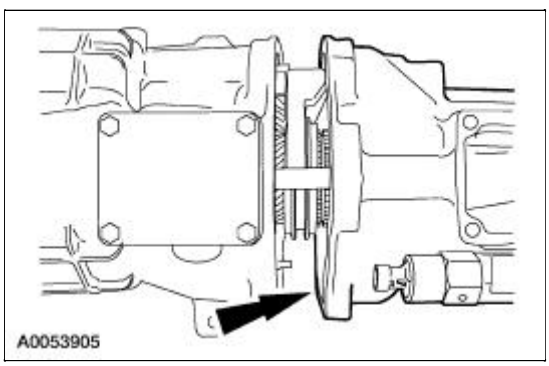
   Using a 5/32-inch drift and a hammer, drive the roll pin downward, then remove the rear offset shift lever.

   - Inspect the rear offset shift lever for wear or damage. Install a new lever as necessary.
   - Discard the roll pin.

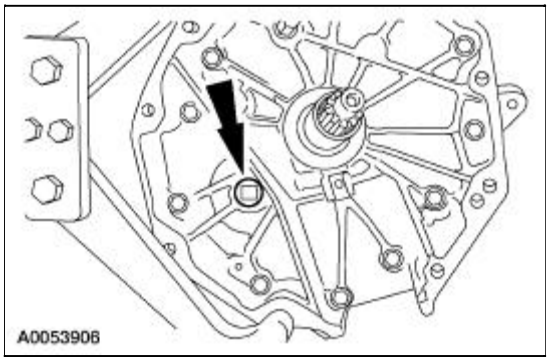


8. Remove the eight bolts and carefully separate the extension housing from the transmission.



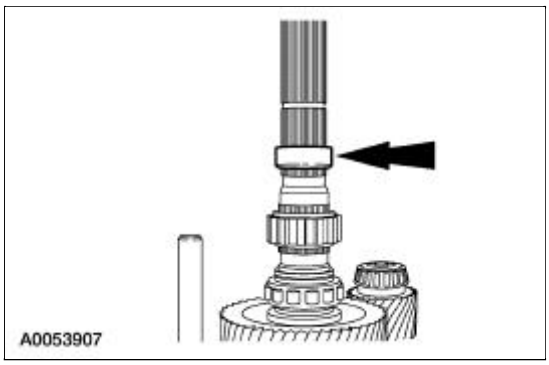


9. Remove the plug from the transmission adapter plate.

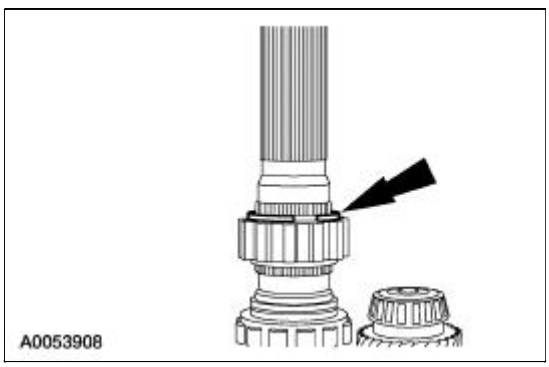


10. **NOTE:** Rotate the transmission to a vertical position.

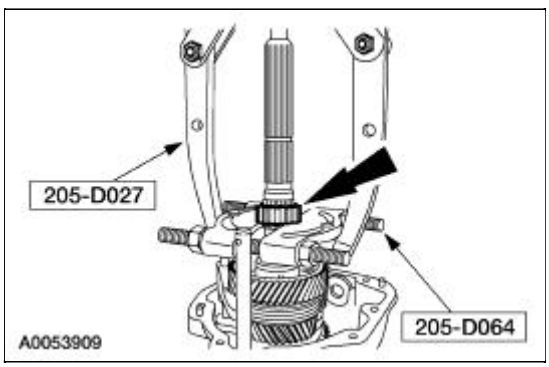
    Remove the shipping seal.



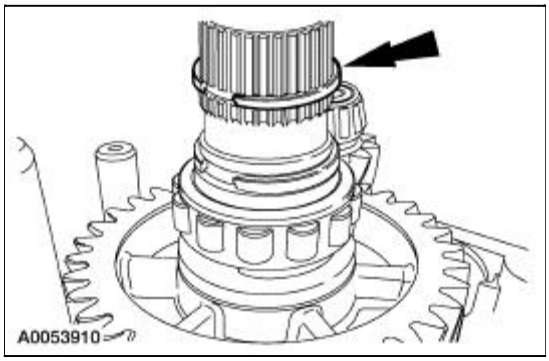
11. Remove the output shaft speed (OSS) sensor tone wheel retaining ring.



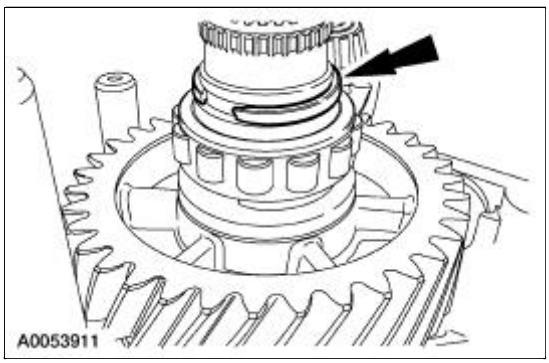
12. Using the special tools, remove the OSS sensor tone wheel.



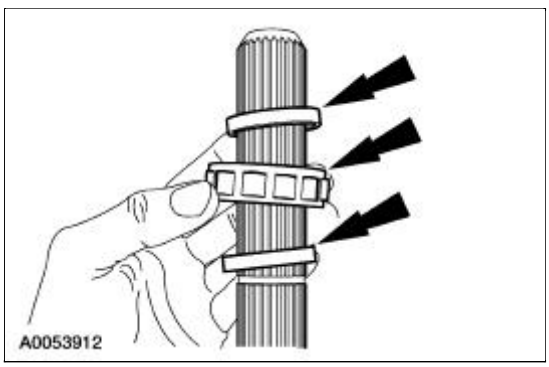
13. Remove and discard the OSS sensor tone wheel lower retaining ring.



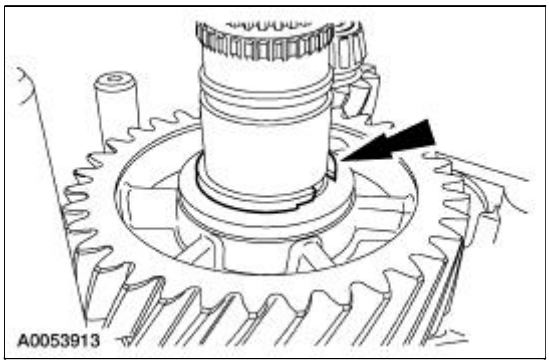
14. Remove and discard the rear mainshaft roller bearing snap ring.



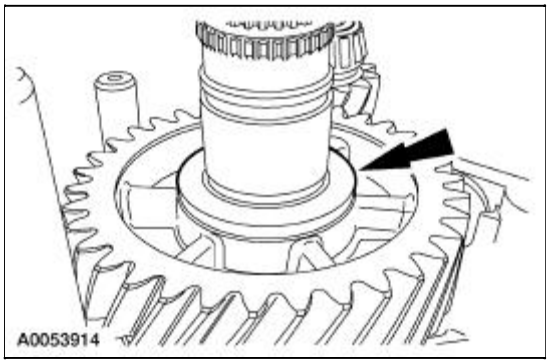
15. Remove the upper spacer, the rear mainshaft roller bearing and the lower spacer.
    - Inspect the rear mainshaft roller bearing for wear or damage. Install a new bearing as necessary.



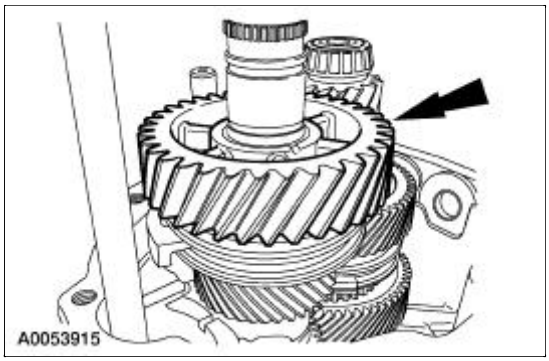
16. Remove and discard the reverse gear snap ring.



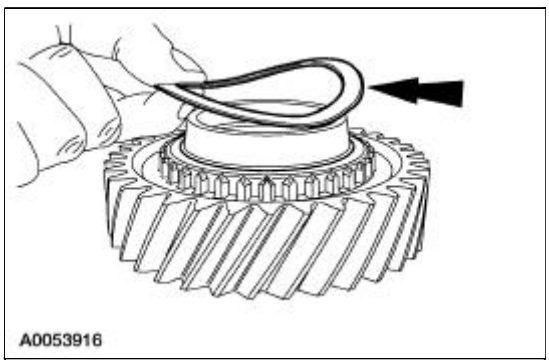
17. Remove the reverse gear thrust washer.



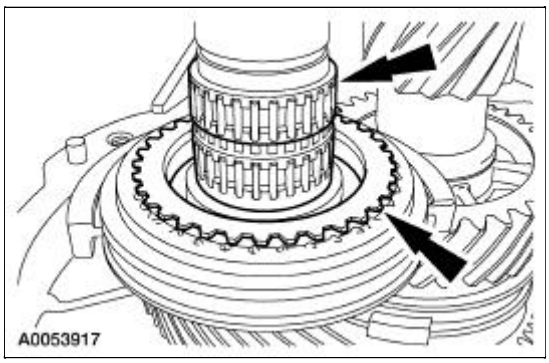
18. Remove the reverse gear.
    - Inspect reverse gear for wear or damage. Install a new gear as necessary.



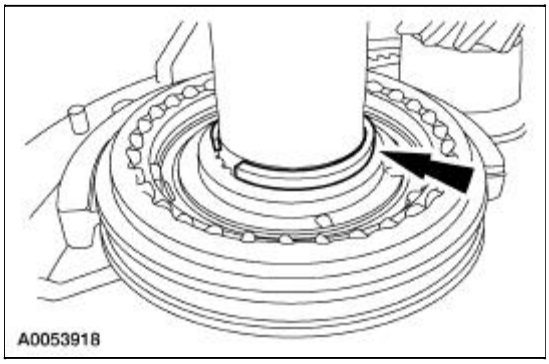
19. Remove the wave washer from the reverse gear.



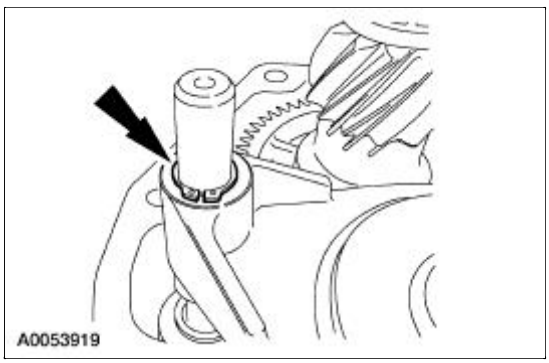
20. Remove the reverse gear needle bearing and the reverse gear synchronizer blocking ring.
    - Inspect the needle bearing for wear or damage. Install a new bearing as necessary.



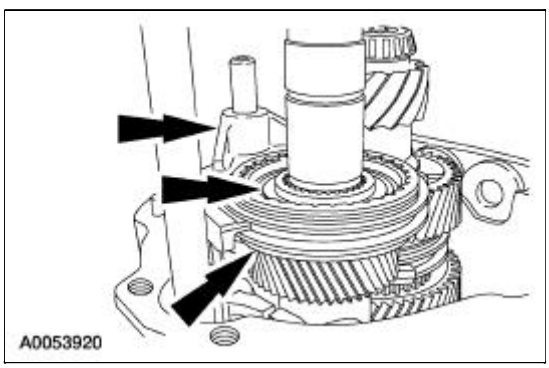
21. Remove the reverse gear synchronizer snap ring.



22. Remove the reverse shift fork snap ring.



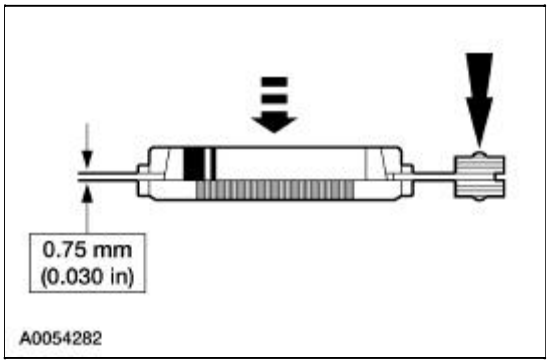
23. Remove the reverse shift fork, the reverse synchronizer and the thrust washer as an assembly.



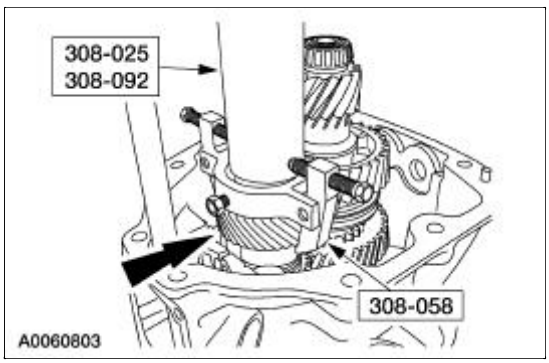
24. Inspect the synchronizer for the following:
    - Check for worn, nicked or broken teeth. Install a new synchronizer as necessary.
    - Check keys for wear or distortion. Check the springs for distortion. Install a new synchronizer as necessary.

25. Inspect the synchronizer blocking ring for the following:
    - Check for wear or damage. Install a new synchronizer blocking ring as necessary.
    - Check the clearance between the synchronizer blocking ring and the gear.
        - Position the blocking ring onto the gear. Make sure the correct blocking ring is measured with the correct gear and that the blocking ring is fully seated on the gear.
        - Insert a feeler gauge and measure the clearance, while applying pressure and rotating the blocking ring. The measurement should be the same around the entire circumference. If the clearance is less than 0.75 mm (0.030 in), install new

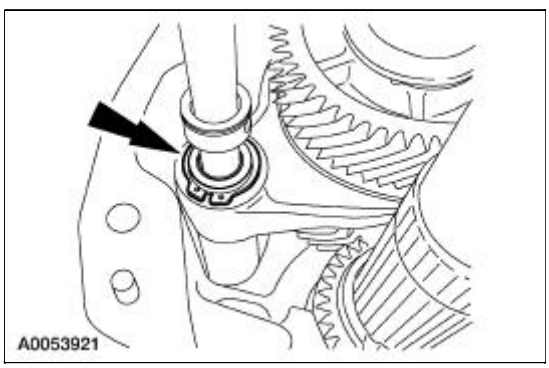
blocking ring.



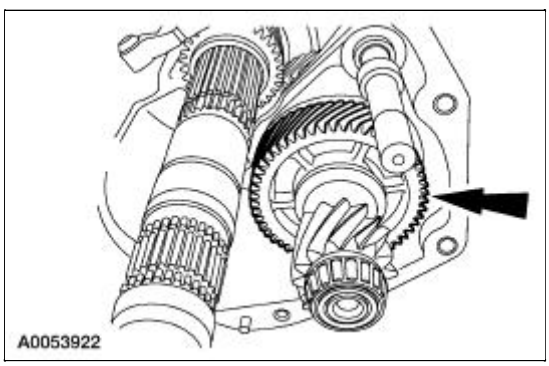
26. Using the special tools, remove the fifth/sixth driven gear.



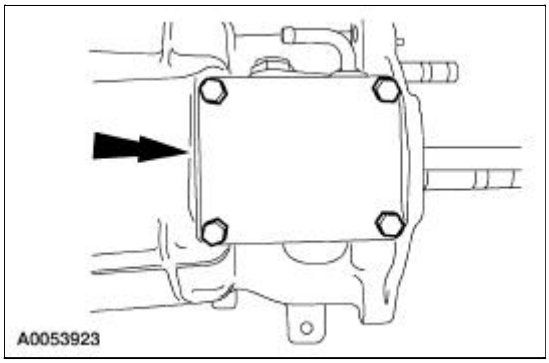
27. Remove the fifth/sixth shift fork snap ring.



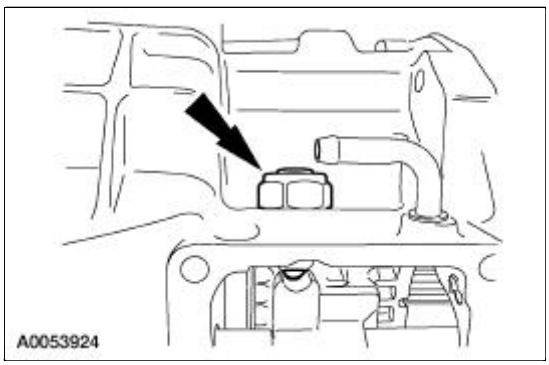
28. Rotate the transmission to the horizontal position, then remove the countershaft extension as an assembly.



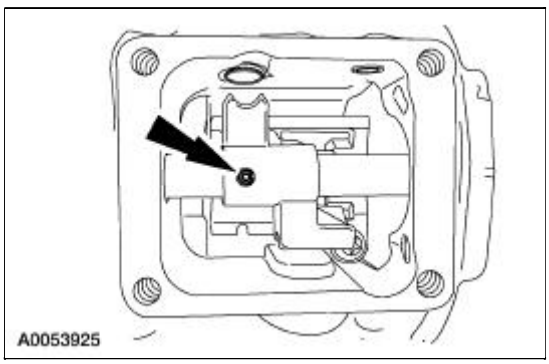
29. Remove the shift detent cover.



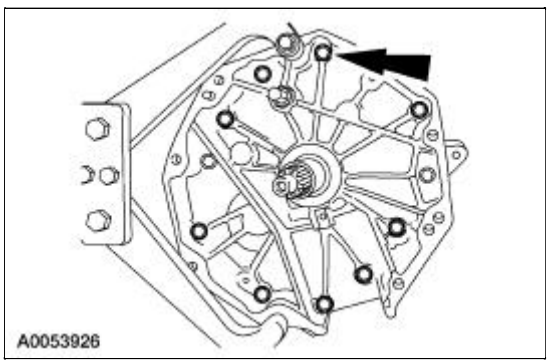
30. Remove the shift detent assembly.



31. Using a 5/32-inch drift and a hammer, drive the roll pin downward.

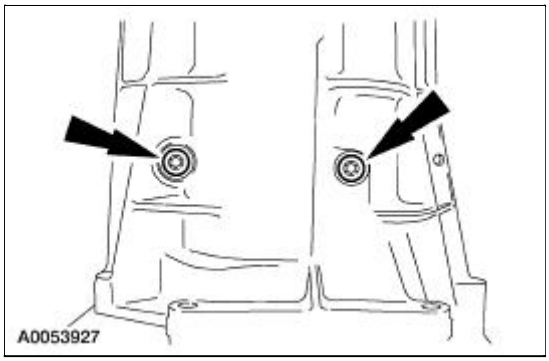


32. Remove nine of the adapter-to-transmission case bolts.

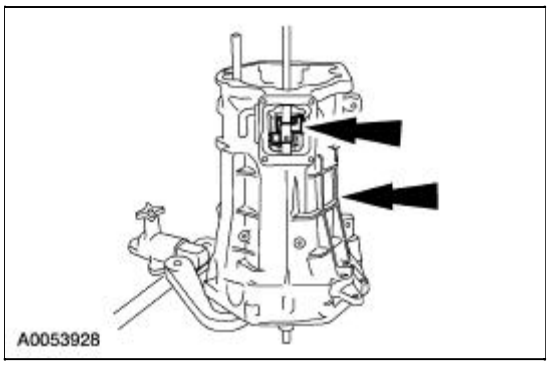


33. **NOTE:** Rotate the transmission to a vertical position.

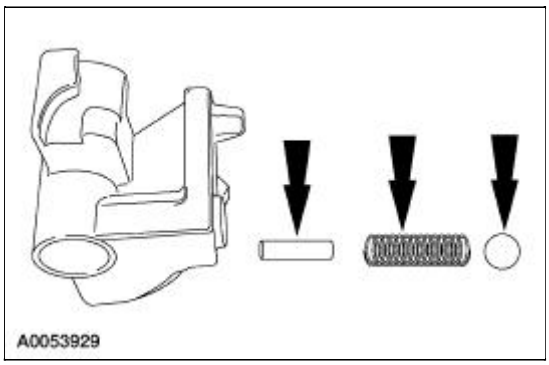
    Remove the shift lever guide bolts.



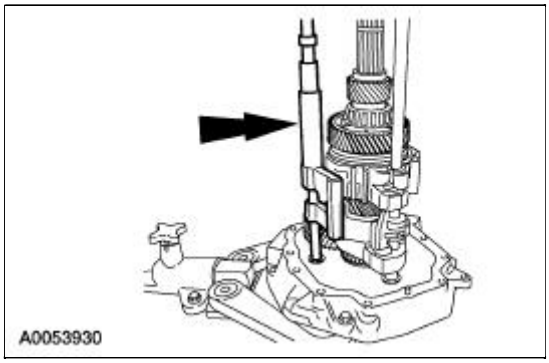
34. Remove the two remaining adapter-to-transmission case bolts, then remove the transmission case and the front offset lever.
    - Slide the transmission case upward, off the mainshaft and shift rails. Hold the offset lever against the guide plate to prevent the release of the dent ball and spring.



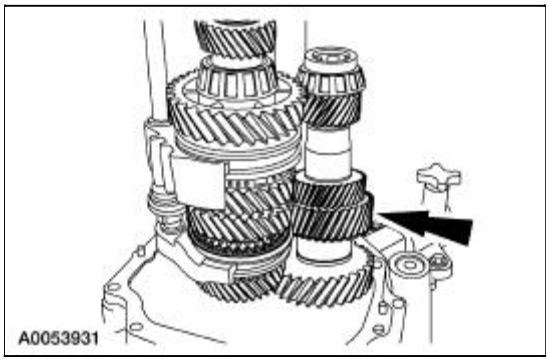
35. Remove the dent ball, spring and roll pin from the front offset lever.



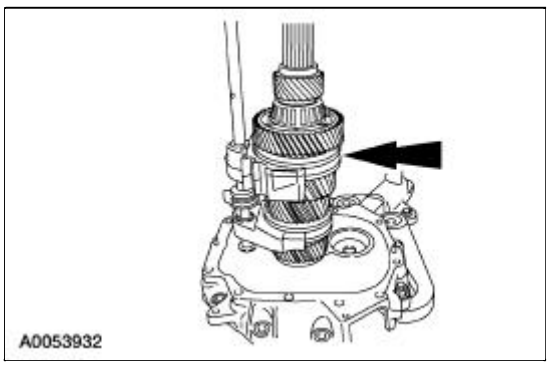
36. Rotate the fifth/sixth and reverse shift levers from the shift interlock plate, then remove the fifth/sixth and reverse shift rail assembly.



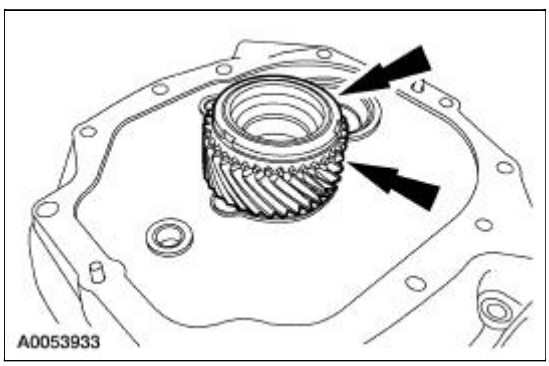
37. Lift up the mainshaft, then remove the countershaft.



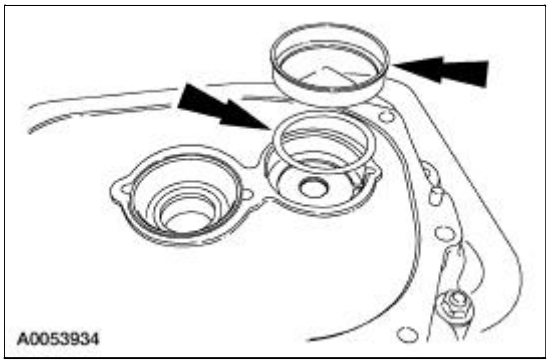
38. Remove the mainshaft and shift rail as an assembly. Separate the shift rail assembly from the mainshaft on the work bench.



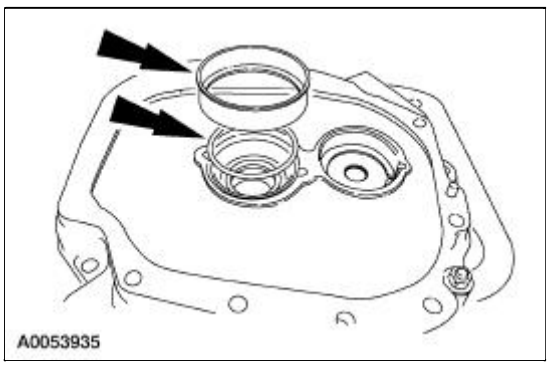
39. Remove the input shaft and fourth gear synchronizer blocking ring.



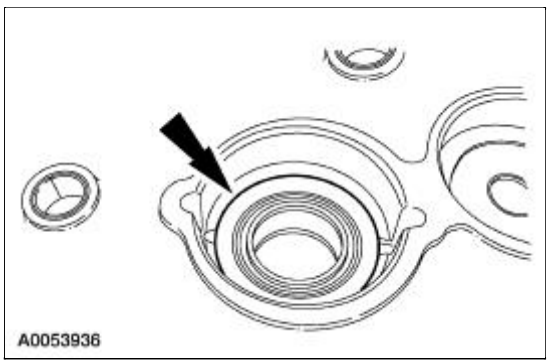
40. Remove the countershaft bearing cup and the countershaft shim.
    - Inspect the cup for wear or damage. Install a new cup and bearing as necessary.
    - Inspect the cup bore for wear, scratches or grooves. Install a new transmission adapter plate as necessary.



41. Remove the input shaft bearing cup and input shaft shim.
    - Inspect the cup for wear or damage. Install a new cup and bearing as necessary.
    - Inspect the cup bore for wear, scratches or grooves. Install a new transmission adapter plate as necessary.



42. Remove and discard the input shaft seal.

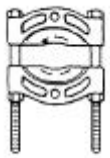
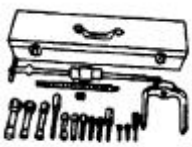


43. **WARNING: Make sure protective eye wear is in place.**

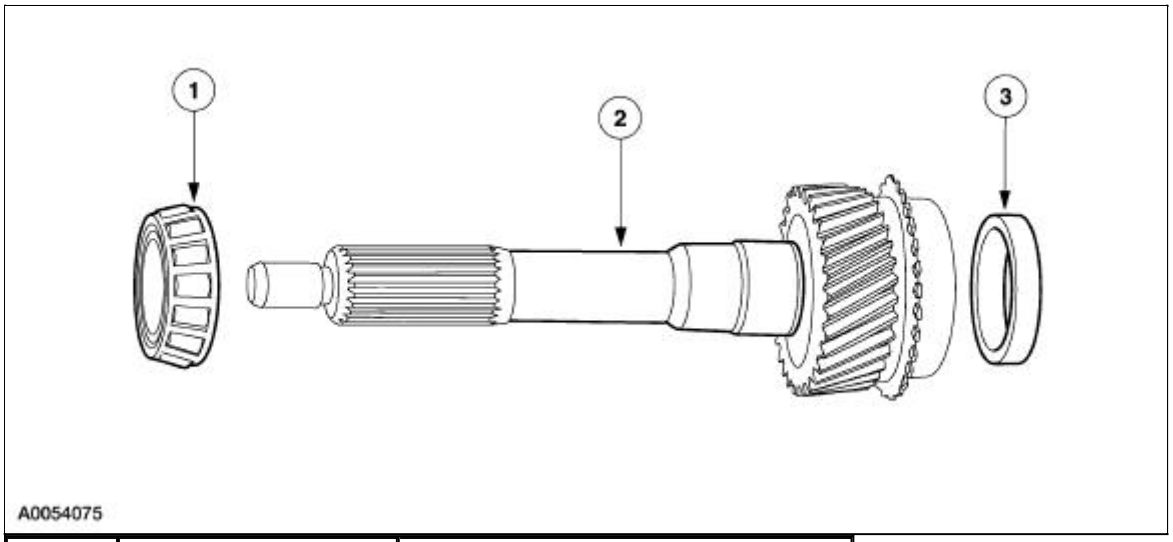
    Clean the transmission adapter plate with solvent and dry with compressed air. Inspect the adapter plate for cracks. Clean and check the sealing surface for nicks or scratches.
    - If the adapter plate is cracked, install a new plate. If the sealing surface has nicks or scratches, use a soft stone or crocus cloth to remove.

Input Shaft and Bearing

Special Tool(s)

ST1254-A	Plate, Bearing/Oil Seal 205-090 (T75L-1165-B)
 ST1368-A	Puller, Bearing 205-D064 (D84L-1123-A)
ST1308-A	Installer, Drive Pinion Bearing Cone 205-004 (T53T-4621-B)
ST2451-A	Adapter Set, Step Plate 205-DS011 (D80L-630-A)
 ST1144-A	Universal Puller Set 303-DS005 (D80L-100-A)

Disassembly and Assembly

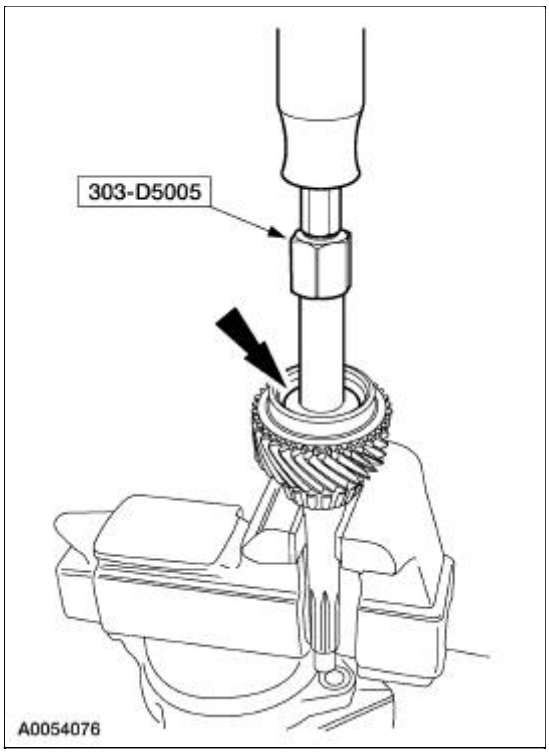


Item	Part Number	Description
1	7025	Input shaft bearing
2	7017	Input shaft
3	—	Input shaft bearing cup

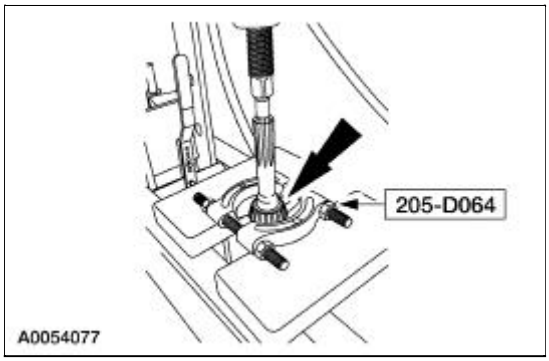
1. **CAUTION: Use a vise with brass jaws or wood blocks.**

   Secure the input shaft in a vise. Using the special tools and a slide hammer, remove the input shaft bearing cup.

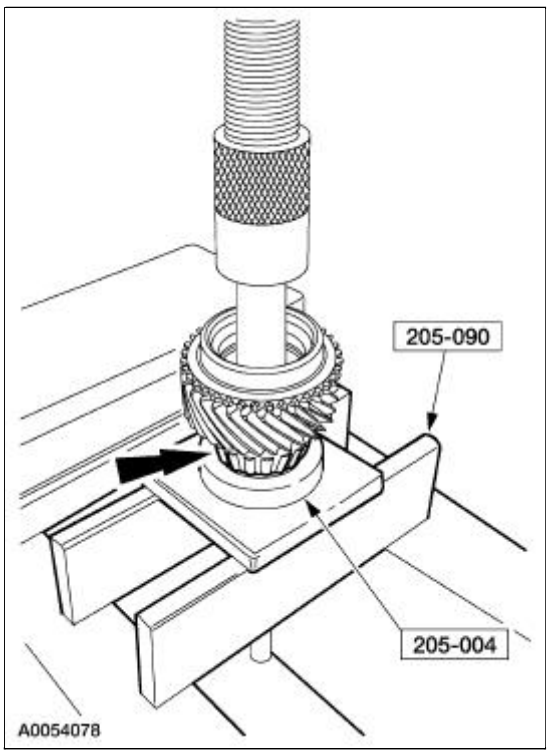
   - Inspect the cup for wear or damage. Install a new bearing cup and bearing as necessary.



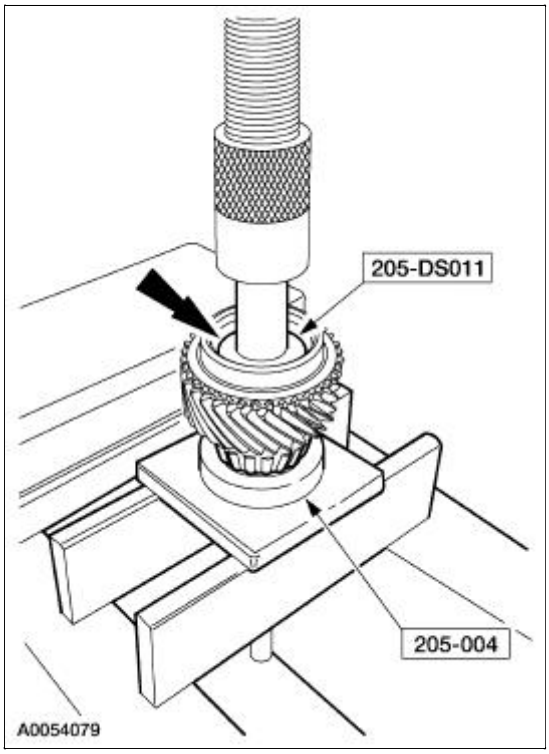
2. Using the special tool and a press, remove the input shaft front bearing.



3. Inspect the input shaft and bearing for wear or damage. Install new components as necessary.
4. Using the special tools and a press, install a new input shaft bearing.
    - Lubricate the bearing with petroleum jelly.

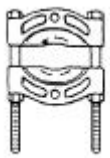


5. Using a suitable driver and the press, install the input shaft bearing cup.
    - Lubricate the bearing cup with petroleum jelly.

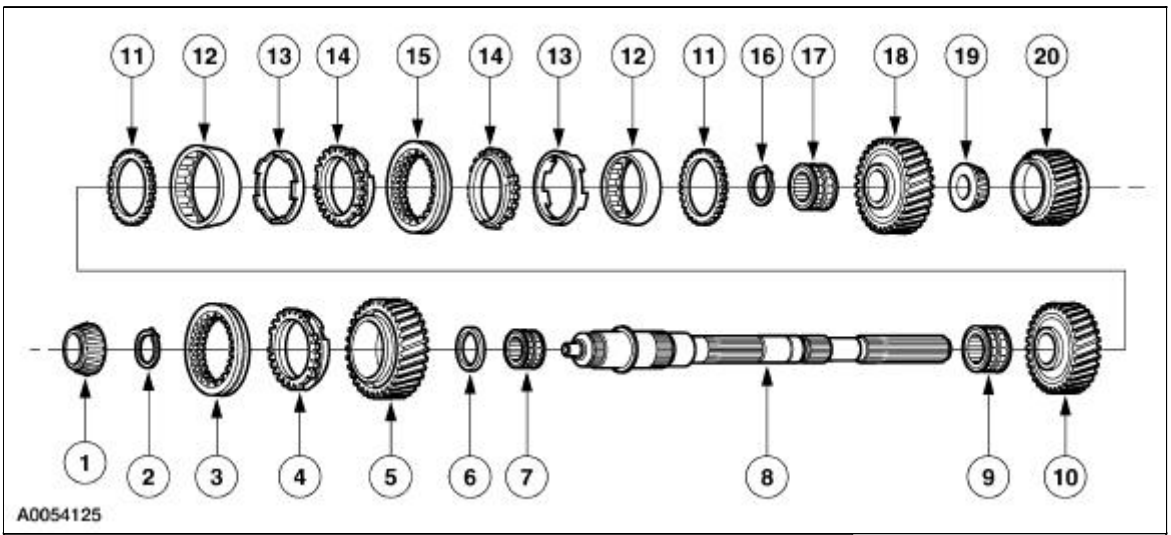

205-DS011
205-004
A0054079

Output Shaft

Special Tool(s)

 ST1368-A	Puller, Bearing 205-D064 (D84L-1123-A)
ST1255-A	Adapter for 303-224 (Handle) 205-153 (T80T-4000-W)
ST2231-A	Installer, Output Shaft Rear Bearing 308-401
ST2163-A	Remover/Installer, Bearing Tube 308-025 (T75L-7025-C)

Disassembly



Item	Part Number	Description
1	7025	Output shaft front bearing

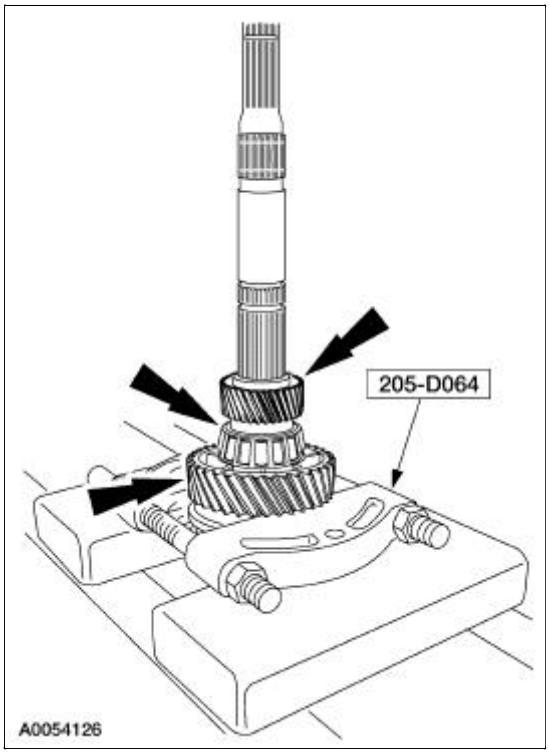
2	—	Snap ring
3	7124	Third/fourth synchronizer assembly
4	7107	Third/fourth synchronizer blocking ring
5	7B340	Third gear
6	—	Spacer
7	—	Third gear needle bearing
8	7061	Output shaft
9	—	Second gear needle bearing
10	7102	Second gear
11	—	Thrust washer
12	—	Synchronizer inner cone
13	—	Synchronizer friction cone
14	7107	Second gear synchronizer blocking ring
15	7124	First/second synchronizer assembly
16	—	Snap ring
17	—	First gear needle bearing
18	7100	First gear
19	—	Output shaft rear bearing
20	—	Fifth driven gear

1. **CAUTION: Hand tighten the special tool to prevent gear damage.**

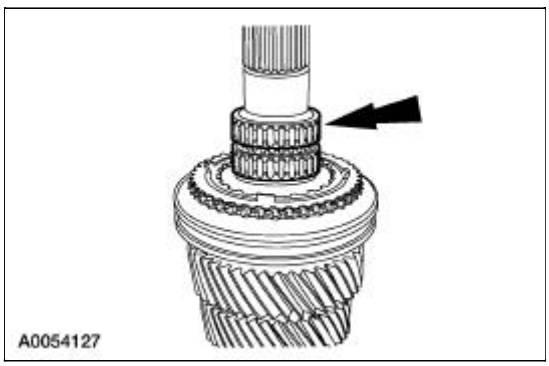
   CAUTION: Support the output shaft while using the press to prevent damage to the shaft or gears.

   Using the special tool and a press, remove first gear, the output shaft rear bearing and the fifth driven gear.

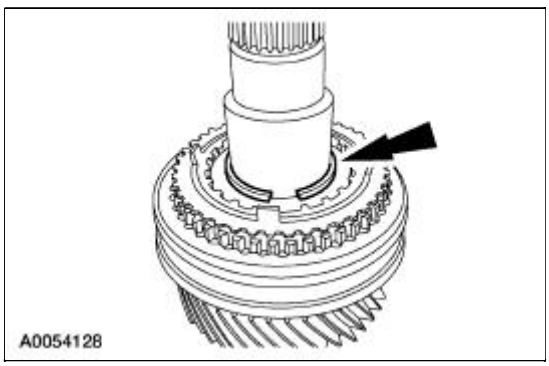
   - Discard the output shaft bearing.
   - Inspect the gear for wear or damage. Install a new gear as necessary.



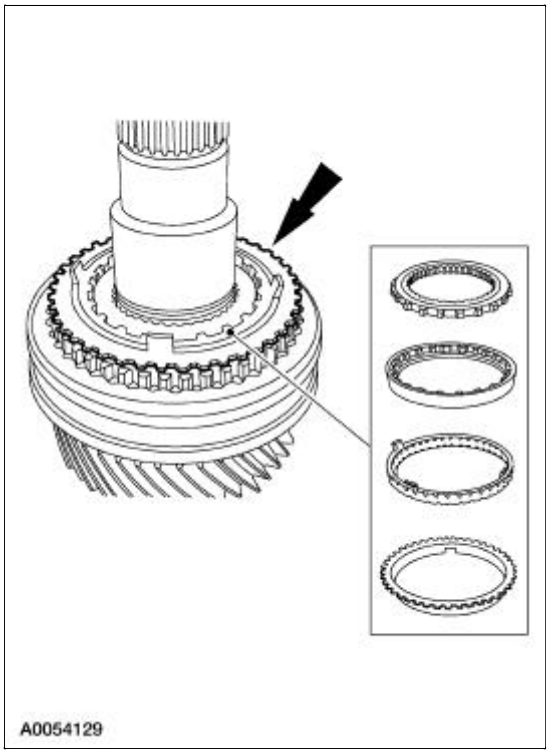
2. Remove the first gear needle bearing.
    - Inspect the needle bearing for wear or damage. Install a new needle bearing as necessary.



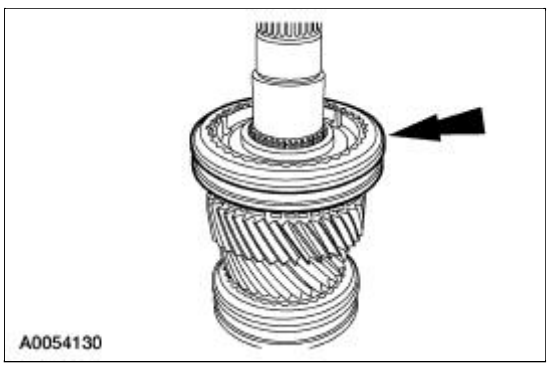
3. Remove and discard the snap ring.



4. Remove the first gear synchronizer thrust washer, the inner cone, the friction cone and the first gear synchronizer blocking ring.
    - Inspect all components for wear or damage. Install new components as necessary.



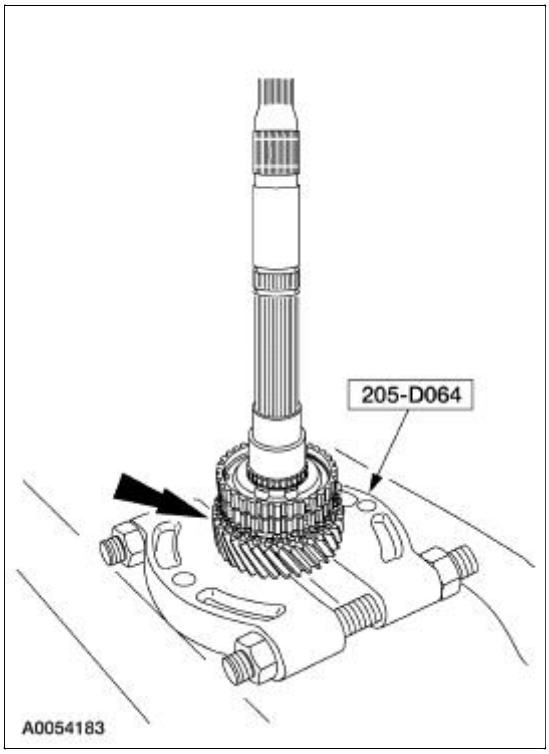
5. Remove the synchronizer spring, then remove the synchronizer sleeve.



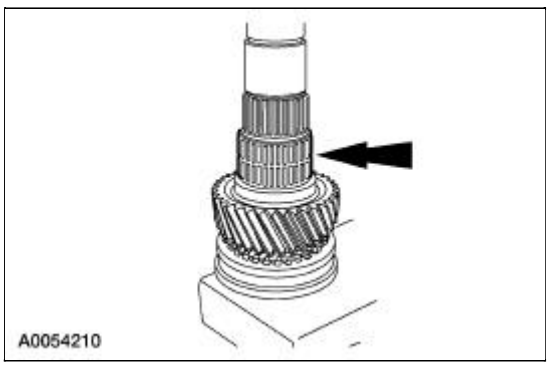
6. **NOTE:** Install the special tool behind second gear with the flat side of the tool facing second gear.

   Using the special tool, remove the second gear, the second gear synchronizer thrust washer, the inner cone, the friction cone, the second gear synchronizer blocking ring and the synchronizer hub.

   - Inspect the gear for wear or damage. Install a new gear as necessary.
   - Inspect the all synchronizer components for wear or damage. Install a new components as necessary.

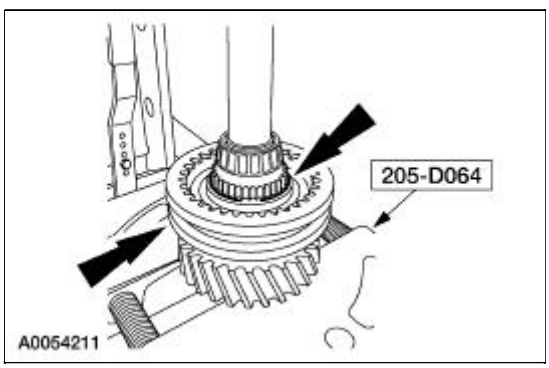


7. Remove the second gear needle bearing.
    - Inspect the needle bearing for wear or damage. Install a new needle bearing as necessary.

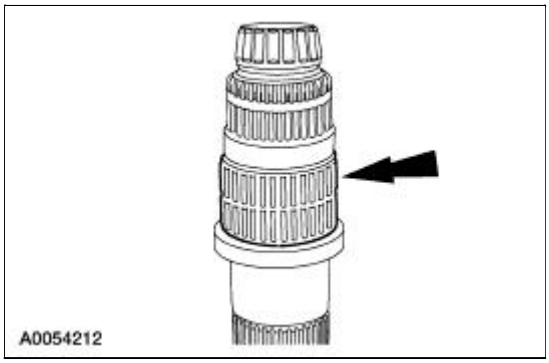


8. **NOTE:** Reposition the output shaft on the press with the input shaft end facing upward.

    Remove and discard the snap ring, then using the special tool, remove the third/fourth gear synchronizer assembly, the third gear synchronizer blocking ring and the third gear.
    - Inspect the gear for broken or cracked teeth. Install a new gear as necessary.

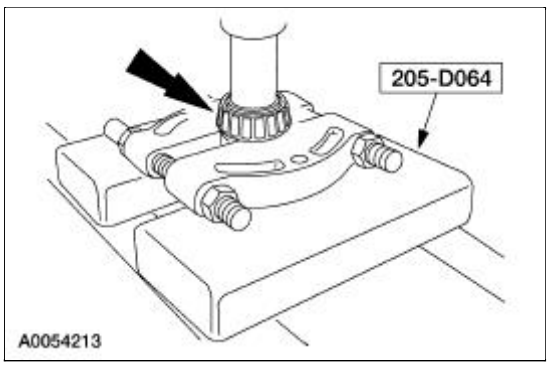


9. Remove the third gear needle bearing.
    - Inspect the needle bearing for wear or damage. Install a new needle bearing as necessary.



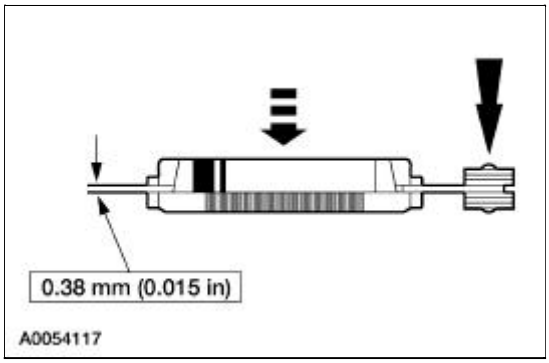
10. **NOTE:** Install the special tool with the flat side facing the bearing.

    Using the special tool, press the output shaft front bearing from the output shaft.



11. Inspect the synchronizers.
    - Check for worn, nicked or broken teeth. Install a new synchronizer as necessary.
    - Check keys for wear or distortion. Install a new synchronizer as necessary.
    - Check springs for distortion. Install a new synchronizer as necessary.

12. Inspect the synchronizer blocking rings.
    - Check for wear or damage. Install new synchronizer blocking rings as necessary.
    - Check the clearance between the synchronizer blocking ring and the gear.
        - Position the blocking ring onto the gear. Make sure the correct blocking ring is measured with the correct gear and that the blocking ring is fully seated on the gear.
        - Insert a feeler gauge and measure the clearance, while applying pressure and rotating the blocking ring. The measurement should be the same around the entire circumference. If the clearance is less than 0.38 mm (0.015 in), install new blocking rings.

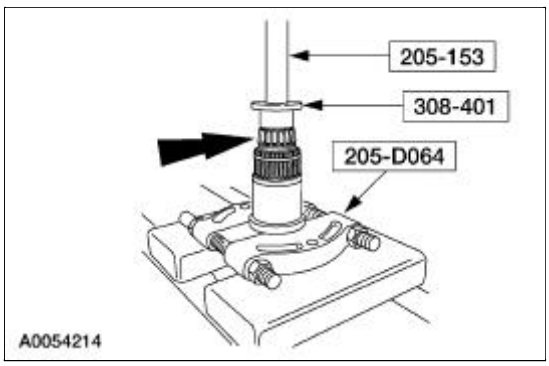


13. Inspect the output shaft for scoring or worn or damaged splines. Install a new output shaft as necessary.

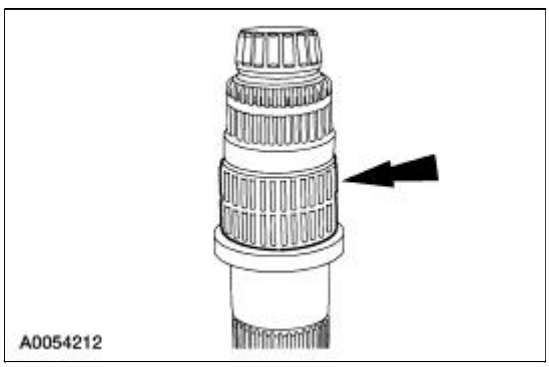
Assembly

1. Lubricate all components with the recommended transmission fluid when reassembling.

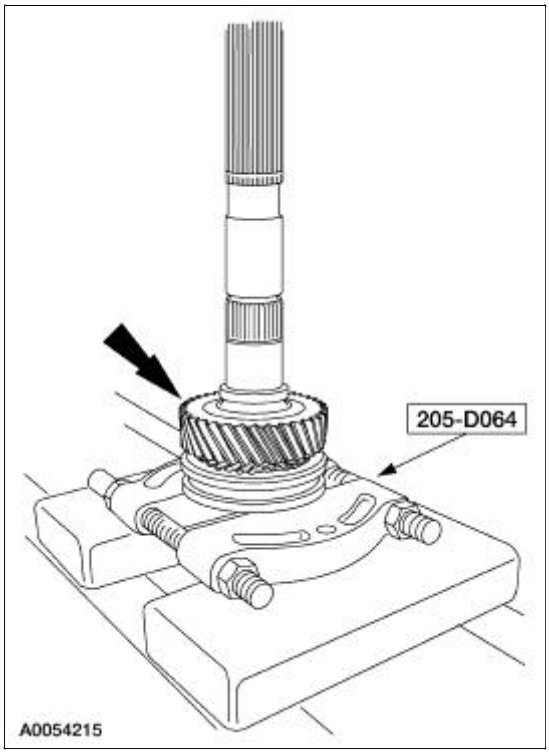
2. Using the special tools, press the output shaft front bearing on the output shaft.



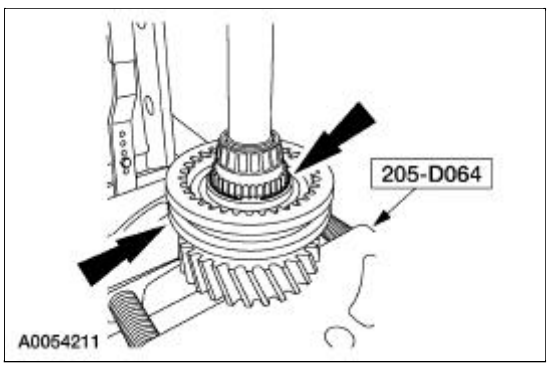
3. Install the third gear bearing.
    - Apply petroleum jelly to the bearing.



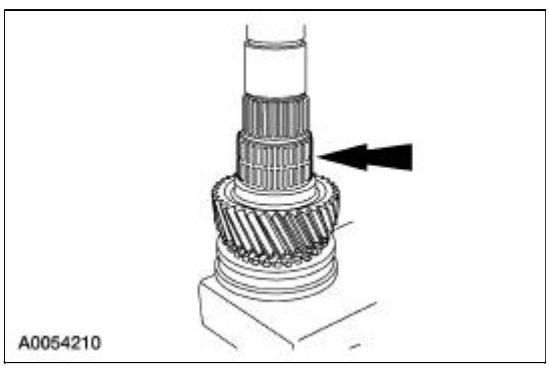
4. Install third gear, the third gear synchronizer blocking ring and the third/fourth gear synchronizer assembly. Position the output shaft with the output end facing upward. Using the special tool, press the third/fourth gear synchronizer assembly into place.
    - Install the synchronizer body with the groove facing third gear.
    - Stop press operation before keys engage the blocking ring slots. Lift and rotate the third gear and the blocking ring until the keys are seated in the blocking ring.



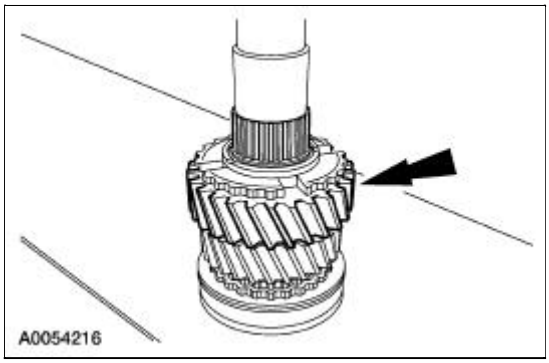
5. Install a new snap ring.



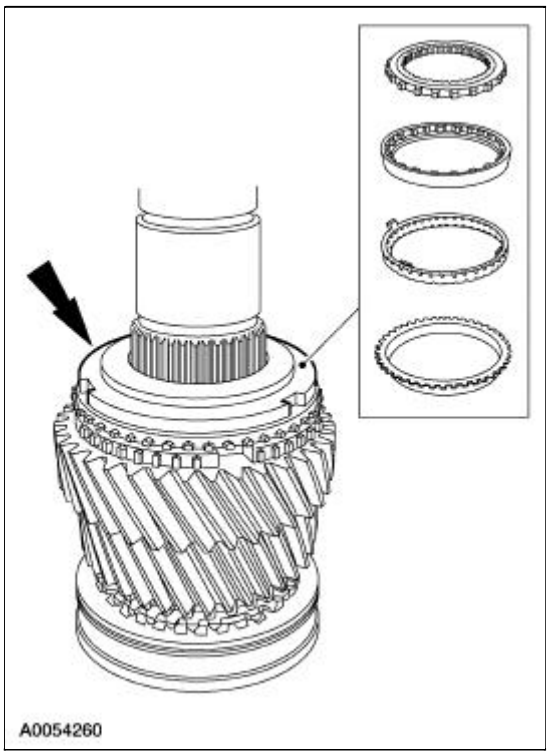
6. Install the second gear needle bearing.
    - Apply petroleum jelly to the bearing.



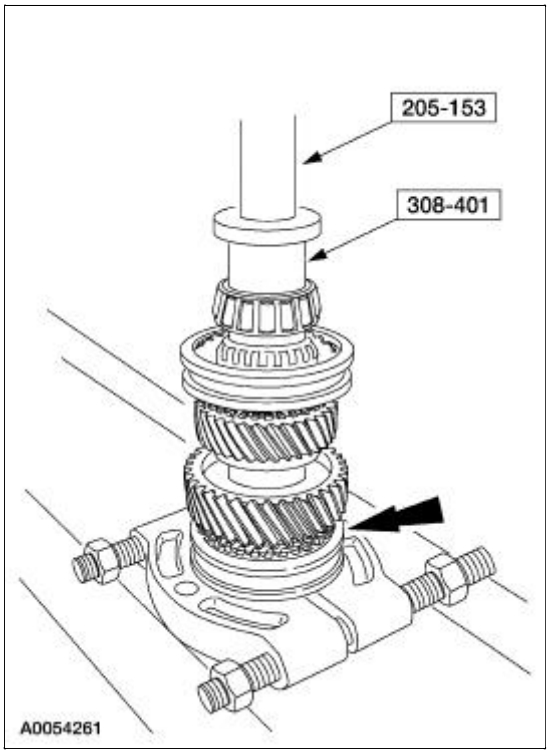
7. Install second gear.



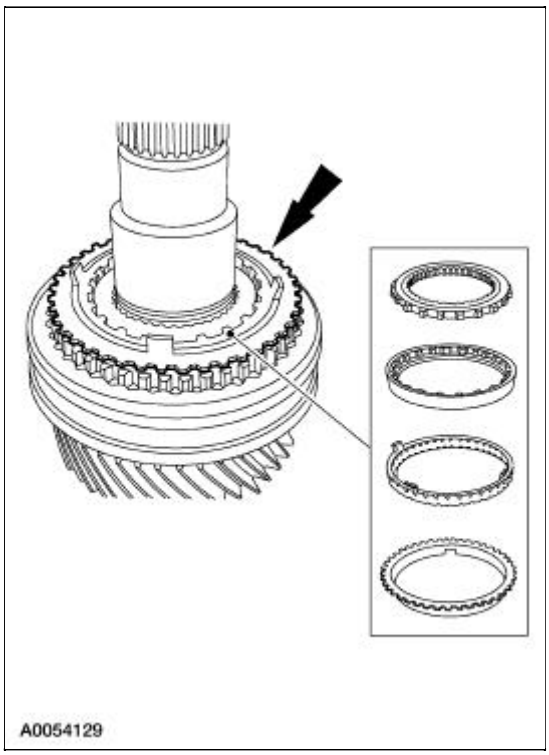
8. Install the second gear synchronizer thrust washer, the inner cone, the friction cone and the second gear synchronizer blocking ring.
    - Align the blocking ring tabs with the second gear slots.



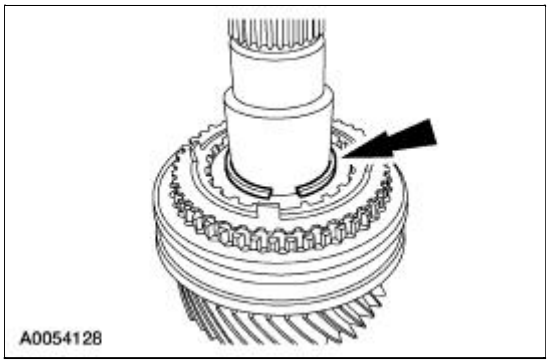
9. Install the first/second gear synchronizer assembly. Position the output shaft with the output end facing downward. Using the special tools, press the first/second gear synchronizer assembly into place.
    - Install the synchronizer with the groove on the sleeve facing first gear.
    - Stop press operation before keys engage the blocking ring slots. Lift and rotate the second gear and the blocking ring until the keys are seated in the blocking ring.



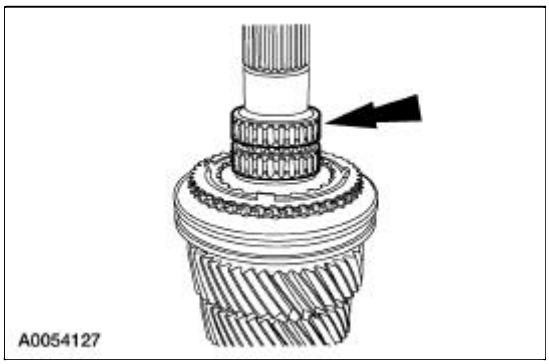
10. Install the first gear synchronizer thrust washer, the inner cone, the friction cone and the first gear synchronizer blocking ring.



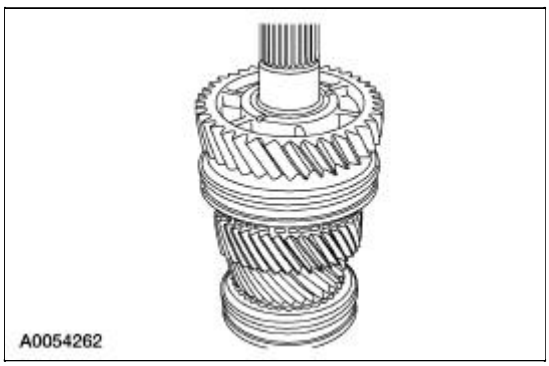
11. Install a new snap ring.



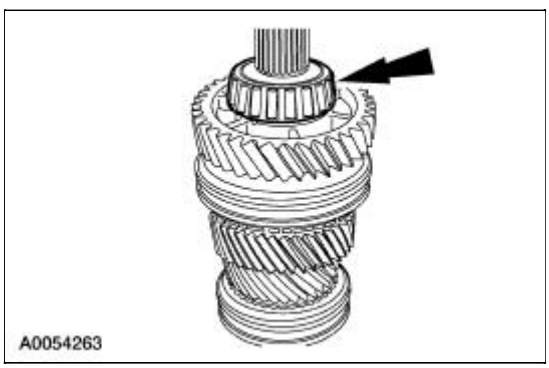
12. Install the first gear needle bearing.
    - Apply petroleum jelly to the bearing.



13. Install first gear.
    - Rotate the gear to align the gear slots with the inner cone tabs.



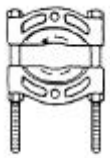
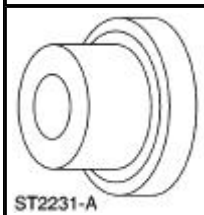
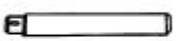
14. Install a new rear output shaft bearing.



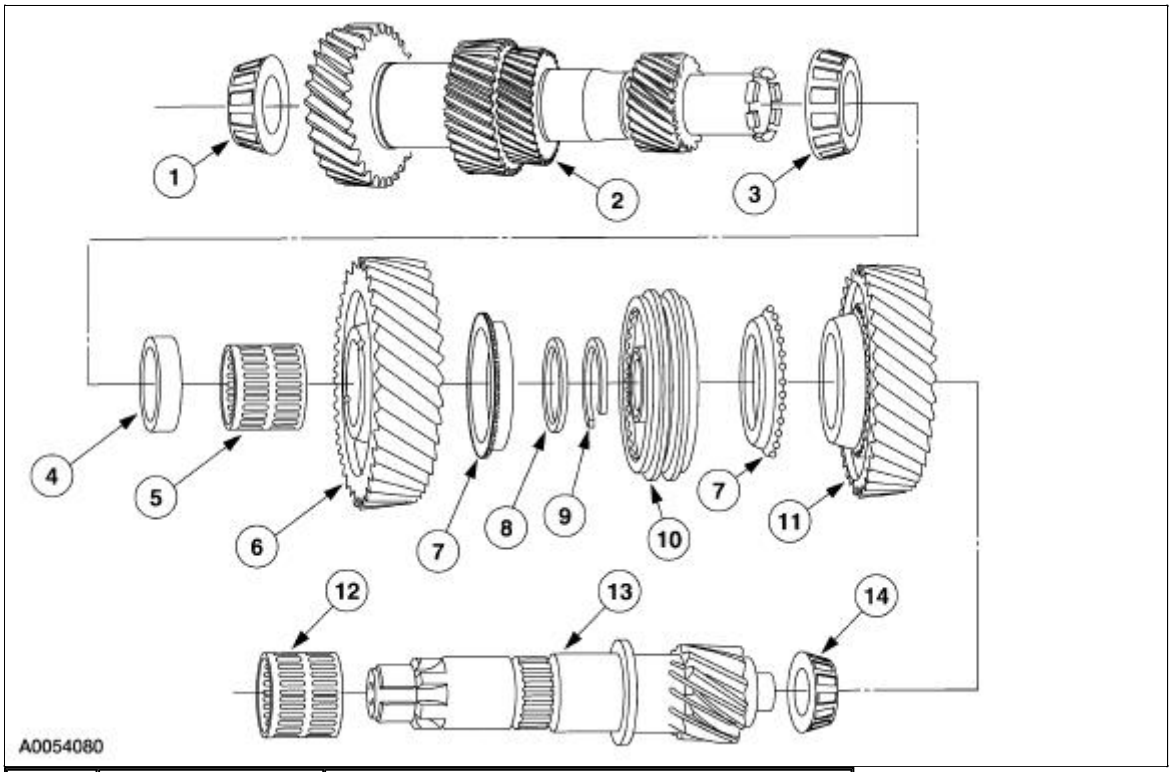
15. Using the special tools, install the fifth driven gear.

Countershaft

Special Tool(s)

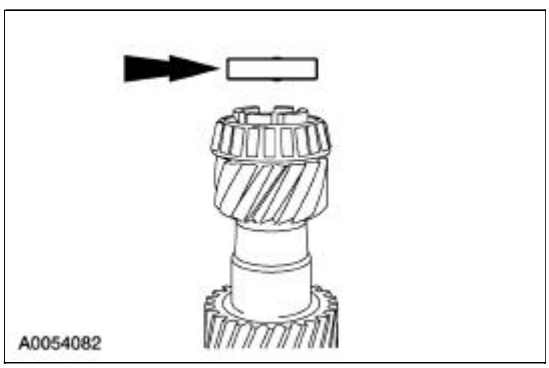
ST1254-A	Plate, Bearing Oil Seal 205-090 (T75L-1165-B)
 ST1368-A	Puller, Bearing 205-D064 (D84L-1123-A)
ST1308-A	Installer, Drive Pinion Bearing Cone 205-004 (T53T-4621-B)
ST1937-A	Remover/Installer, Bearing Tube 308-025 (T75L-7025-C)
 ST2231-A	Installer, Output Shaft Rear Bearing 308-401
 ST1255-A	Adapter for 303-224 (Handle) 205-153 (T80T-4000-W)

Disassembly and Assembly

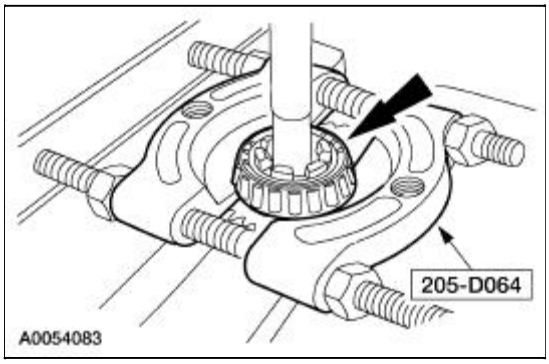


Item	Part Number	Description
1	7025	Countershaft front bearing
2	7113	Countershaft
3	—	Countershaft rear bearing
4	—	Thrust washer
5	—	Sixth gear needle bearing
6	—	Sixth gear
7	—	Synchronizer blocking ring
8	—	Spacer
9	—	Snap ring
10	—	Fifth/sixth synchronizer assembly
11	—	Fifth gear
12	—	Fifth gear needle bearing
13	—	Countershaft extension
14	—	Countershaft extension bearing

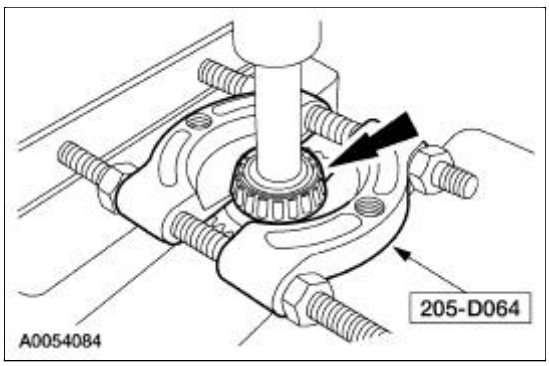
1. Remove the thrust washer.



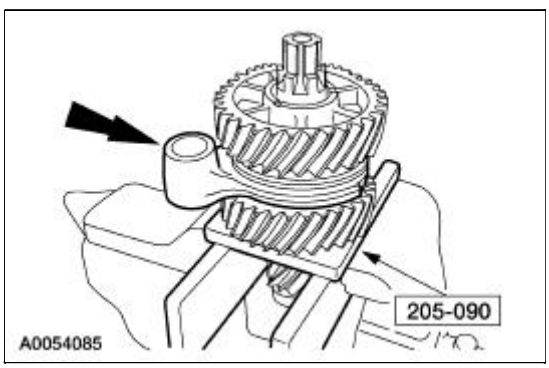
2. Using the special tool and a press, remove the countershaft rear bearing.



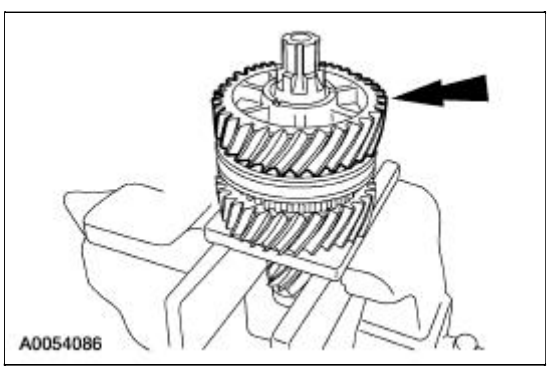
3. Using the special tool and a press, remove the countershaft front bearing.



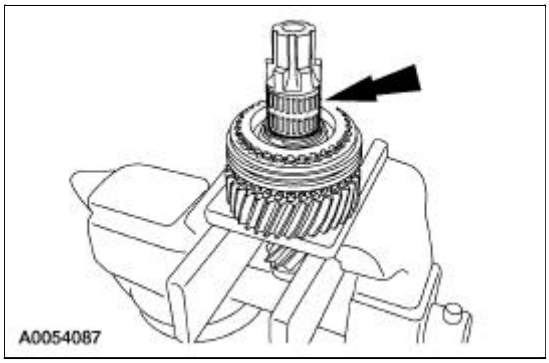
4. Place the special tool in a vise. Position the countershaft extension in the tool with the sixth drive gear facing upward. Remove the fifth/sixth shift fork.



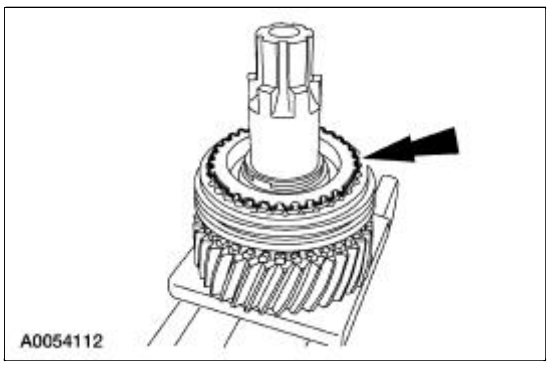
5. Remove the sixth drive gear.



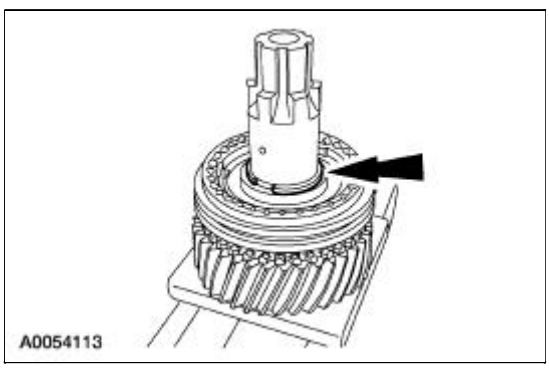
6. Remove the sixth drive gear needle bearing.



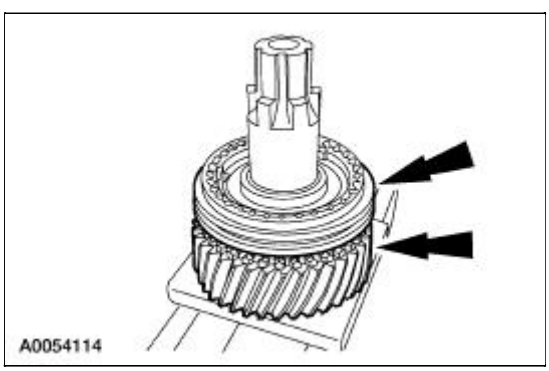
7. Remove the sixth drive gear synchronizer blocking ring.



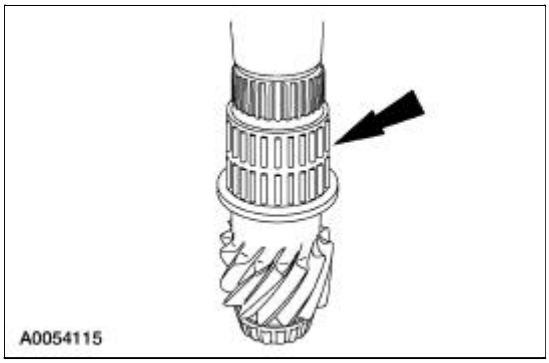
8. Remove and discard the fifth/sixth synchronizer snap ring.



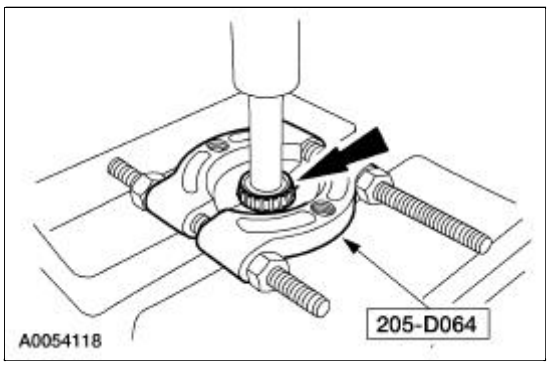
9. Using the special tool, press the fifth/sixth synchronizer and the fifth drive gear off the shaft.



10. Remove the fifth drive gear needle bearing.

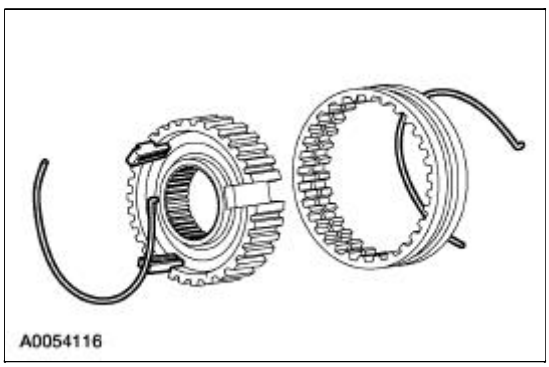


11. Using the special tool, remove the countershaft extension bearing.



12. Inspect the countershaft and countershaft extension.
    - Check the shaft surface for wear or damage. Install a new shaft as necessary.
    - Check the gear teeth for wear, pitting, scoring, spalling or fractures. Install new components as necessary.

13. Disassemble the fifth/sixth gear synchronizer assembly.

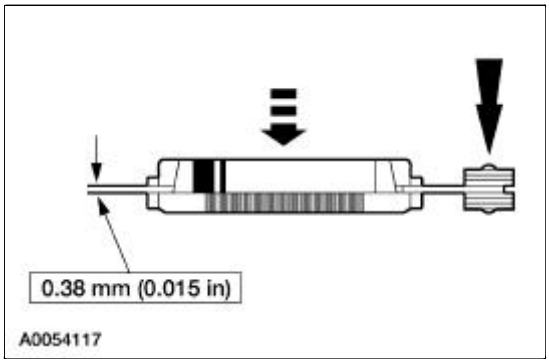


14. Inspect the fifth/sixth synchronizer.
    - Check for worn, nicked or broken teeth. Install a new synchronizer as necessary.
    - Check keys for wear or distortion. Install a new synchronizer as necessary.
    - Check springs for distortion. Install a new synchronizer as necessary.

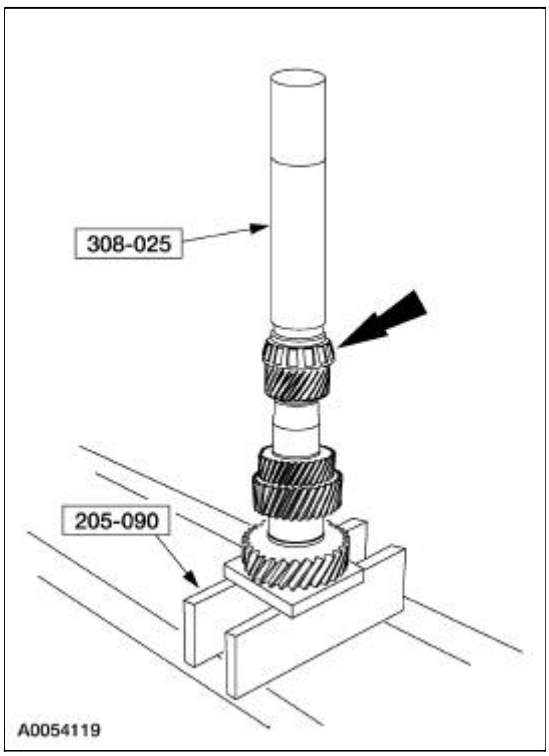
15. Inspect the fifth/sixth synchronizer blocking rings.
    - Check for wear or damage. Install new synchronizer blocking rings as necessary.
    - Check the clearance between the synchronizer blocking ring and the gear.
        - Position the blocking ring onto the gear. Make sure the correct blocking ring is measured with the correct gear and that the blocking ring is fully seated on the

gear.

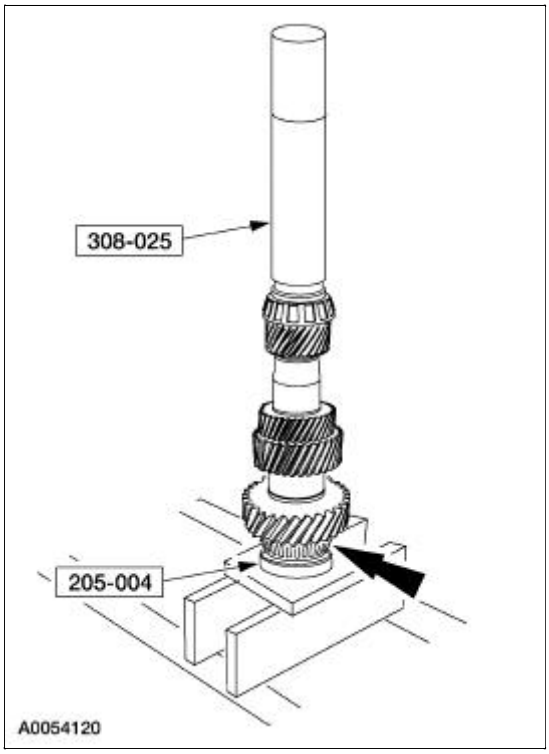
- Insert a feeler gauge and measure the clearance, while applying pressure and rotating the blocking ring. The measurement should be the same around the entire circumference. If the clearance is less than 0.38 mm (0.015 in), install new blocking rings.



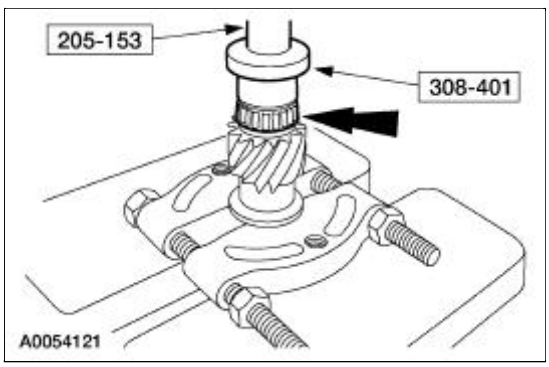
16. Using the special tools, install the countershaft rear bearing.



17. Using the special tools, install the countershaft front bearing.



18. Using the special tools, install the countershaft extension bearing.



19. To assemble, reverse the disassembly procedure.
    - Assemble the synchronizer assembly before installing.

Synchronizers

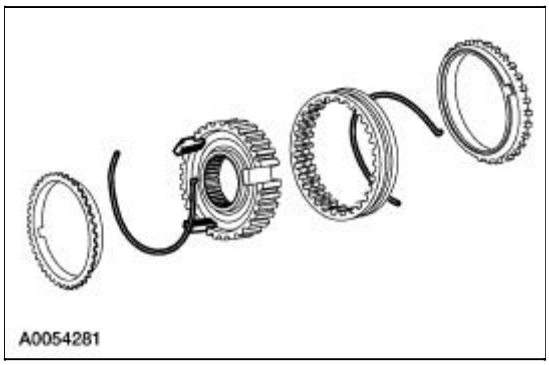
Disassembly and Assembly

NOTE: This procedure applies to all synchronizer assemblies.

1. **NOTE:** Synchronizer components are not interchangeable. During disassembly, mark each individual synchronizer for assembly. Synchronizer hubs and sleeves are a selected assembly and should be kept together as originally assembled. Blocking rings are not interchangeable, do not mix.

   Scribe an alignment mark on the sliding sleeve and the hub for assembly reference.

2. Using a screwdriver, remove the spring. Turn the synchronizer over and remove the second spring. Remove the sliding sleeve and the synchronizer struts from the hub.



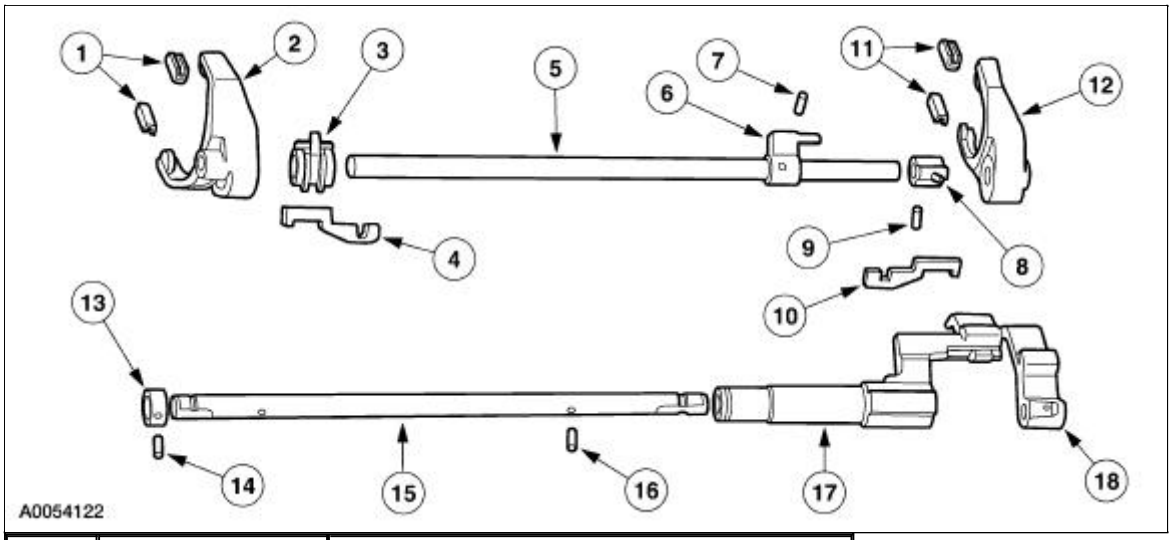
3. **CAUTION: Match the alignment marks made during disassembly. The sleeve and the hub have an extremely close fit. Hold the sleeve and hub square to prevent jamming. Do not force the sleeve onto the hub.**

   Assemble the synchronizer as follows:

   - Position the synchronizer sleeve on the hub. Make sure to align key openings in the hub with the synchronizer sleeve.
   - Install the keys with the slots facing the hub.
   - Install the spring. Locate the tang to one of the key slots and position into place. Install the second spring. Locate the spring tang on the same key but position in the opposite direction.

Gearshift Rail and Fork

Disassembly and Assembly



Item	Part Number	Description
1	—	First/second shift fork pad
2	—	First/second shift fork
3	—	Interlock plate
4	—	Shift link
5	—	First/second, third/fourth shift rail
6	—	Gear select solenoid lever
7	—	Roll pin
8	—	Selector pin
9	—	Roll pin
10	—	Shift link
11	—	Third/fourth shift fork pad
12	—	Third/fourth shift fork
13	—	Shift rail collar
14	—	Roll pin
15	—	Fifth/sixth shift rail
16	—	Roll pin
17	—	Fifth/sixth shift rail lever
18	—	Reverse shift rail lever

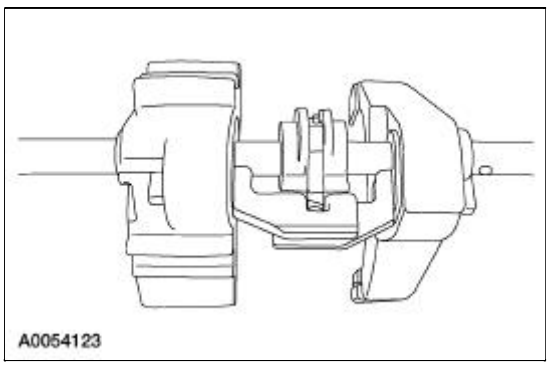
1. Disassemble the first/second and third/fourth shift rail as follows:
    - Rotate the interlock plate until it is opposite of the shift links.
    - Slide off the third/fourth shift fork and shift link. Separate the link from the fork.
    - Slide off the first/second shift fork and shift link. Separate the link from the fork.

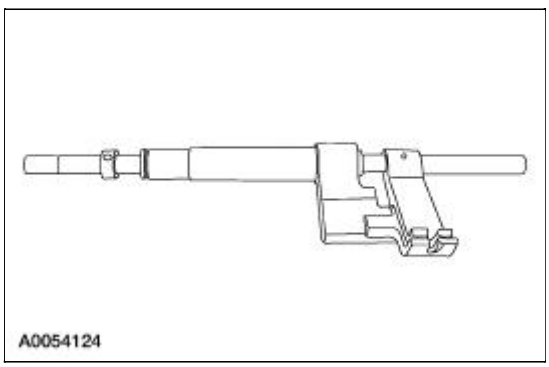
- Remove the interlock plate.
- Using a 5/32-inch drift and a hammer, remove and discard the roll pins. Slide the gear select solenoid lever and the selector pin from the shift rail.

2. Disassemble the fifth/sixth and reverse shift rail as follows:
   - Using a 5/32-inch drift and a hammer, remove and discard the roll pins. Slide the collar and the reverse shift lever from the shift rail.
   - Slide off the fifth/sixth shift lever and shift link.

3. Inspect the shift rail components.
   - Check the rails, shift forks, shift levers and shift links for wear or damage. Install new components as necessary.
   - Check the shift fork pads for wear. Install new pads as necessary.

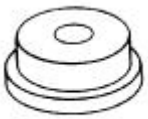
4. To assemble, reverse the disassembly procedure.
   - Install new roll pins.



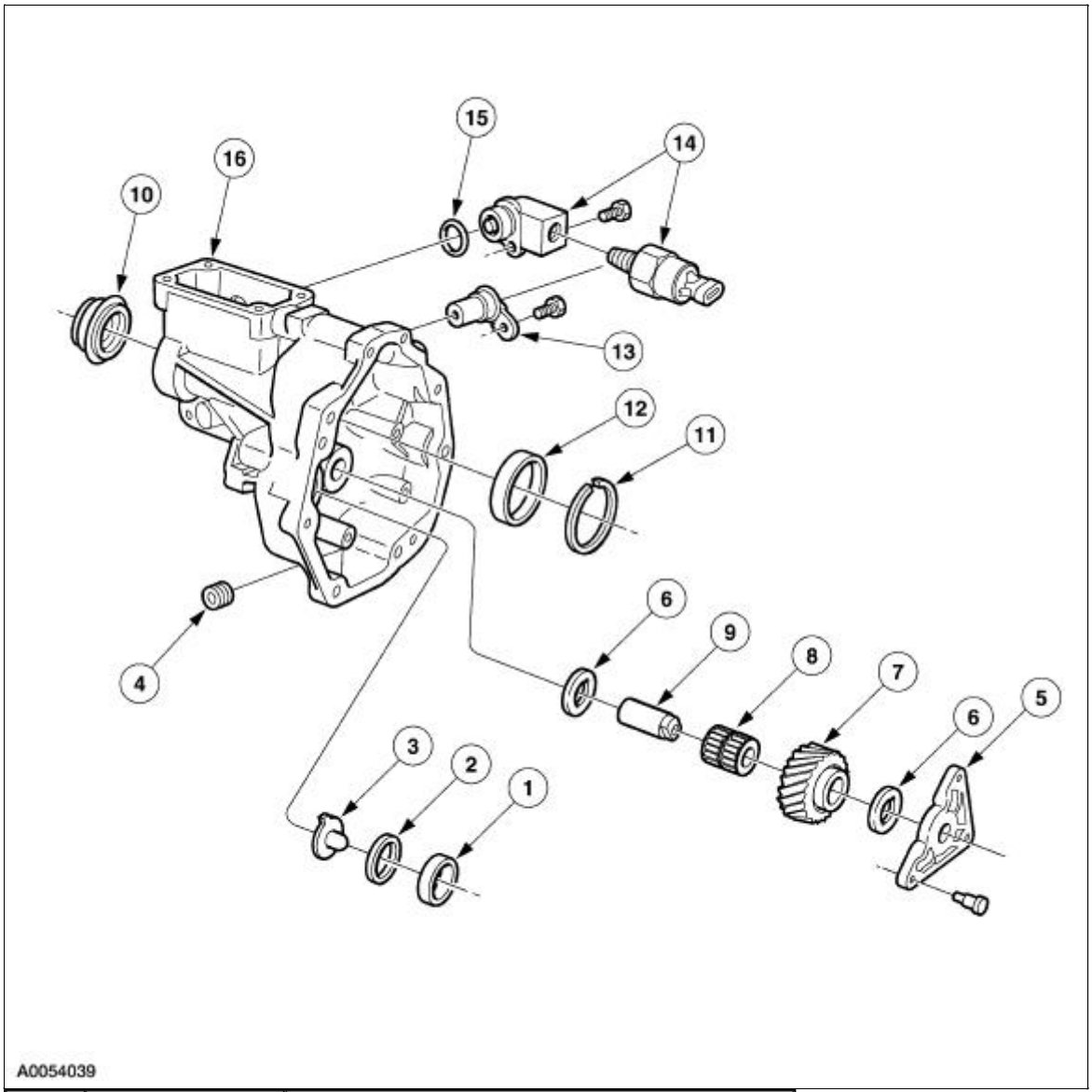


Extension Housing

Special Tool(s)

 ST1555-A	Installer, Bearing Cup 204-039 (T77F-1217-B)
ST1255-A	Adapter for 303-224 (Handle) 205-153 (T80T-4000-W)

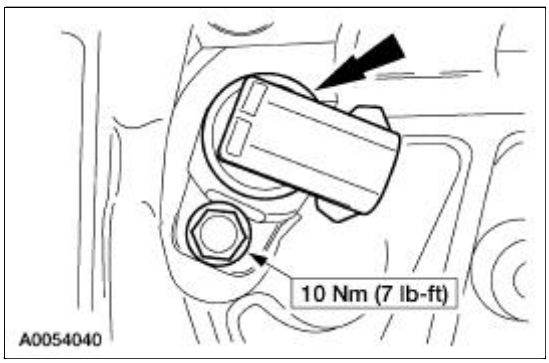
Disassembly and Assembly



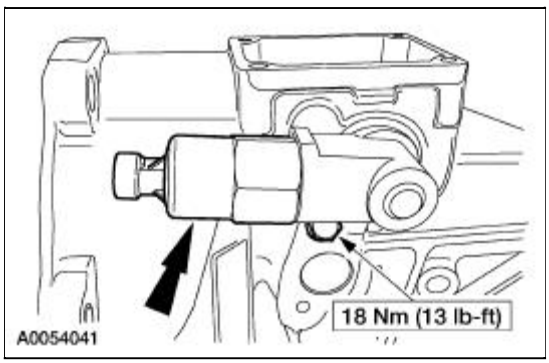
A0054039

Item	Part Number	Description
1	—	Countershaft extension bearing cup
2	—	Countershaft extension bearing shim
3	—	Fluid funnel
4	—	Case plug
5	—	Reverse idler shaft bracket
6	—	Reverse idler gear thrust washer
7	7141	Reverse idler gear
8	—	Reverse idler gear needle bearing
9	7140	Reverse idler gear shaft
10	7052	Extension housing seal
11	—	Snap ring
12	—	Mainshaft bearing cup
13	—	Output shaft speed (OSS) sensor
14	—	Reverse lockout solenoid
15	—	O-ring

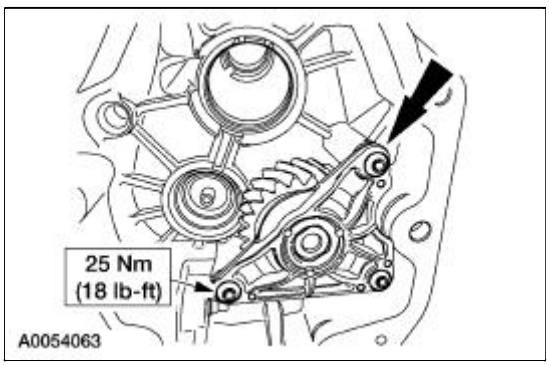
1. Remove the bolt and the output shaft speed (OSS) sensor.



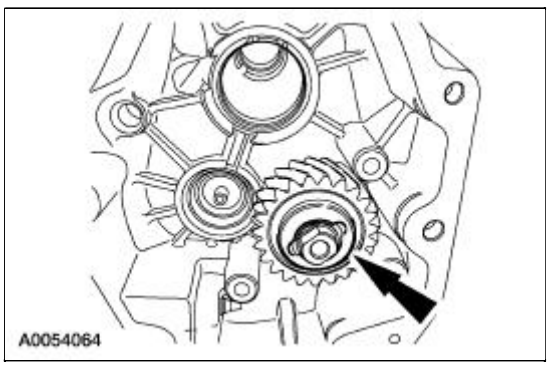
2. Remove the bolt and the reverse lockout solenoid.



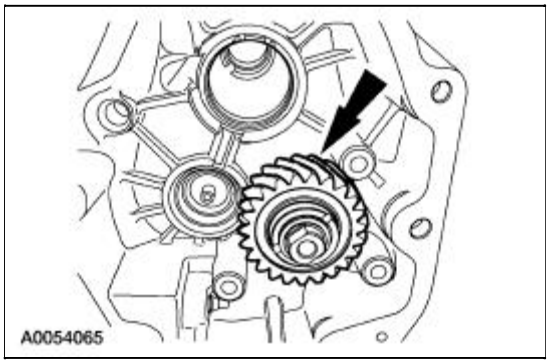
3. Remove the bolts and the reverse idler shaft bracket.



4. Remove the reverse idler gear thrust washer.

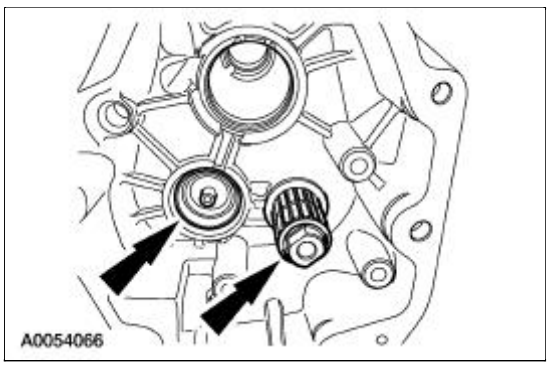


5. Remove the reverse idler gear.

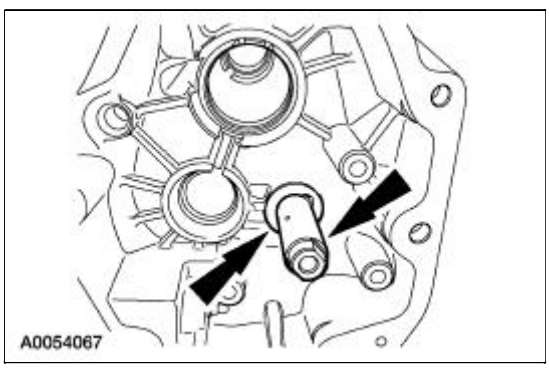


6. **NOTE:** If the countershaft extension bearing was installed new, install a new bearing cup.

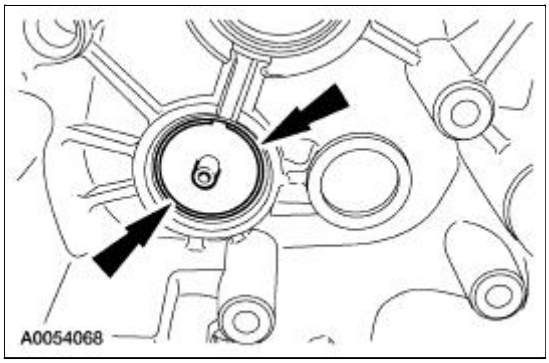
   Remove the reverse idler gear needle bearing and countershaft extension bearing cup.
   - Inspect the needle bearing for wear or damage. Install a new bearing as necessary.
   - Inspect the bearing cup for wear or damage. Install a new bearing and bearing cup as necessary.



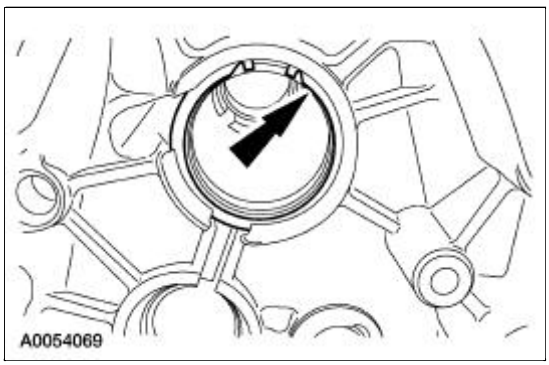
7. Remove the reverse idler gear thrust washer and the reverse idler gear shaft.



8. Remove the countershaft extension bearing shim and the fluid funnel.

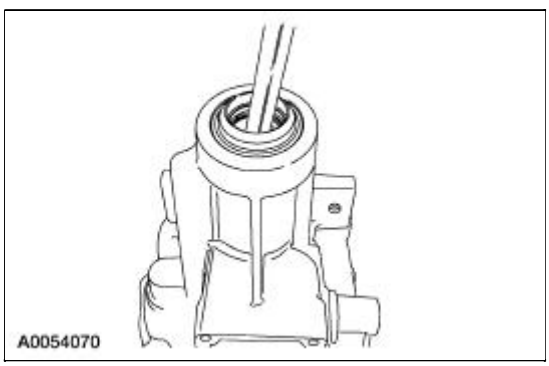


9. Remove the snap ring.

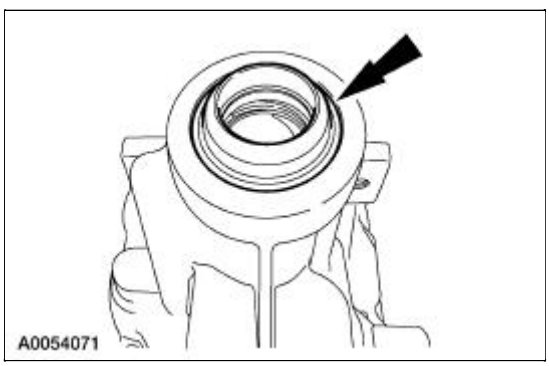


10. **NOTE:** If the mainshaft bearing was install new, install a new bearing cup.

    Position the extension housing with the seal facing upward. Using a brass drift, remove the mainshaft bearing cup.



11. Remove and discard the extension housing seal.

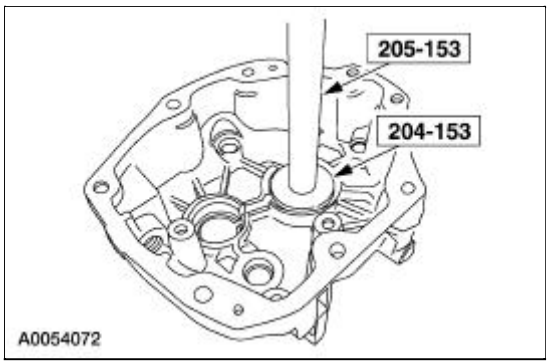


12. **WARNING: Make sure protective eye wear is in place.**

    Clean the housing with solvent and dry with compressed air. Clean and check the sealing surface for nicks or scratches. Inspect the housing for cracks.

    - If the housing is cracked, install a new housing. If the sealing surface has nicks or scratches, use a soft stone or crocus cloth to remove.

13. Using the special tools, install the mainshaft bearing cup.

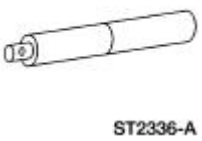
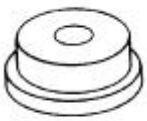
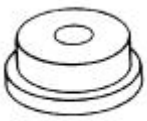


14. Using a suitable driver, install the extension housing seal.
    - Install the seal with the drain hole at the six o'clock position.

15. To assemble, reverse the disassembly procedure.

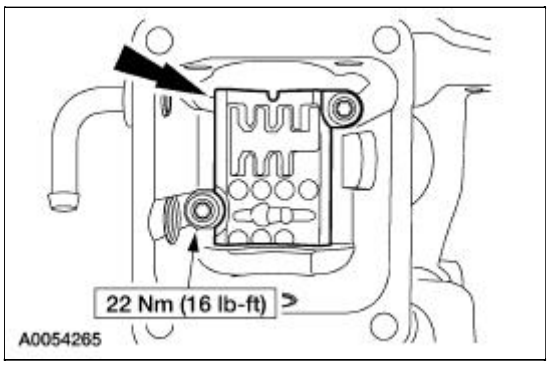
Transmission Case

Special Tool(s)

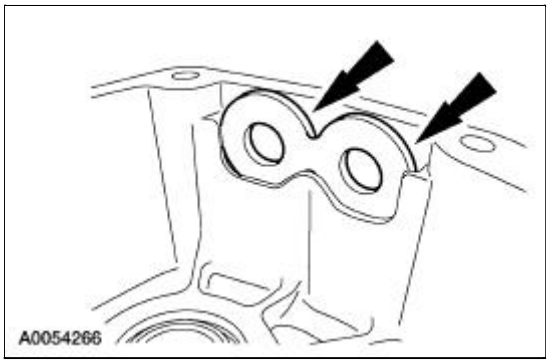
 ST2336-A	Handle 205-D055 (D81L-4000-A)
 ST1555-A	Installer, Bearing Cup 204-039 (T77F-1217-B)
 ST1555-A	Installer, Drive Pinion Bearing Cup 205-054 (T71P-4616-A)
ST2245-A	Installer, Rear Axle Oil Seal 205-155 (T80T-4000-Y)

Disassembly and Assembly

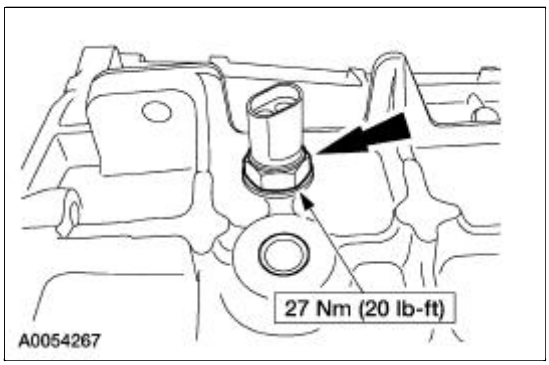
1. Remove the bolts and the guide plate.
    - Inspect the plate for wear or damage. Install a new plate as necessary.



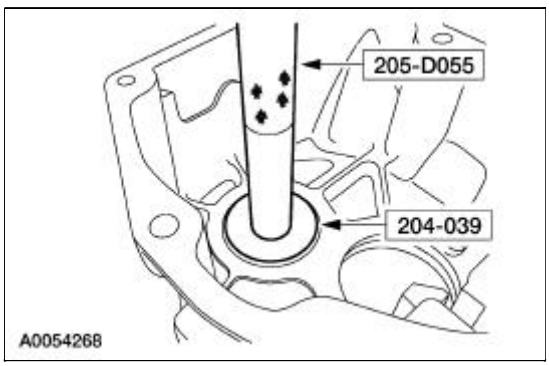
2. Remove the case magnets.



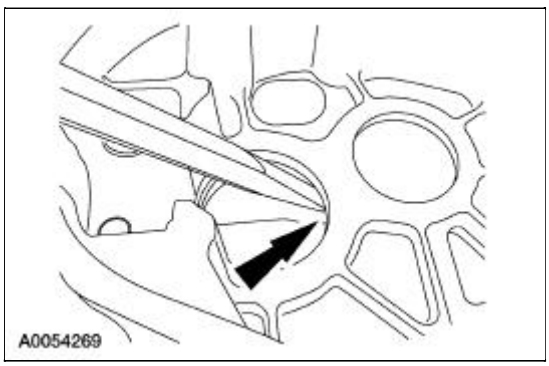
3. Remove the reverse lamp switch.



4. Using the special tools, remove the countershaft bearing cup.



5. Using a brass drift, remove mainshaft bearing cup.



6. Inspect the countershaft and mainshaft bearing cups for wear or damage. Install new components as necessary.

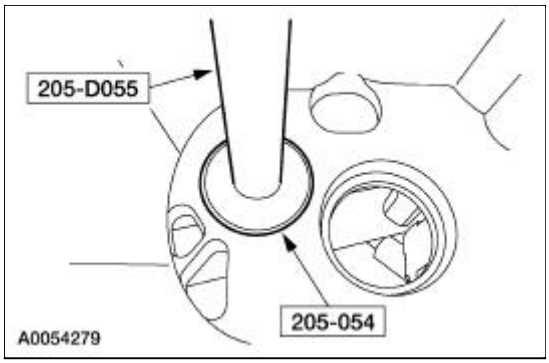
7. **WARNING: Make sure protective eye wear is in place.**

   Clean the case with solvent and dry with compressed air. Clean and check the sealing surface for nicks or scratches. Inspect the case for cracks.

   - If the case is cracked, install a new case. If the sealing surface has nicks or scratches, use a soft stone or crocus cloth to remove.

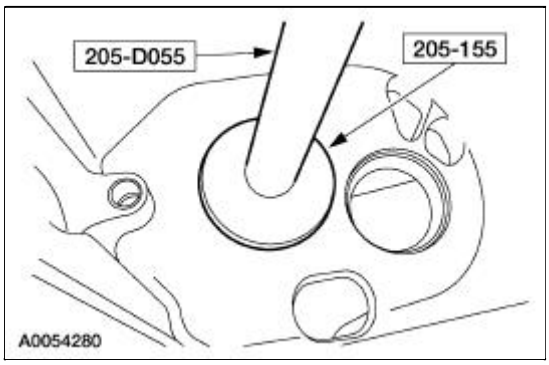
8. **NOTE:** If a new countershaft bearing is being installed, install a new bearing cup. Always install new bearings and cups in a set.

   Using the special tools, install the countershaft bearing cup.



9. **NOTE:** If a new mainshaft bearing is being installed, install a new bearing cup. Always install new bearings and cups in a set.

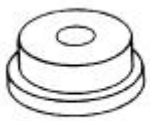
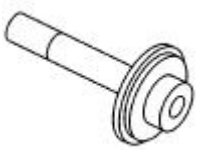
   Using the special tools, install the mainshaft bearing cup.



10. To assemble, reverse the disassembly procedure.

Transmission

Special Tool(s)

ST1214-A	Dial Indicator Gauge with Holding Fixture 100-002 (TOOL-4201-C) or equivalent
ST1188-A	Holding Fixture, Transmission 307-003 (T57L-500-B)
ST2163-A	Remover/Installer, Bearing Tube 308-025 (T75L-7025-C)
 ST1555-A	Installer, Bearing Cup 204-039 (T77F-1217-B)
ST1255-A	Adapter for 303-224 (Handle) 205-153 (T80T-4000-W)
 ST1513-A	Installer, Axle Shaft Oil Seal 205-123 (T78P-1177-A)

Material

Item	Specification
DEXRON III® (ATF) Transmission Fluid XT-2-QDX or equivalent	DEXRON III®
Premium Long Life Grease	ESA-M1C75-B

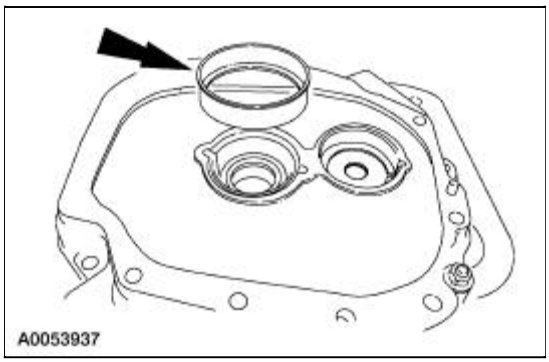
XG-1-C, K or T	
Threadlock and Sealer E0AZ-19554-AA	WSK-M2G351-A5 (type II)
Black Non-Acid Cure Silicone Rubber E7TZ-19562-A	ESL-M4G273-A

1. Lubricate all components with transmission fluid during assembly.

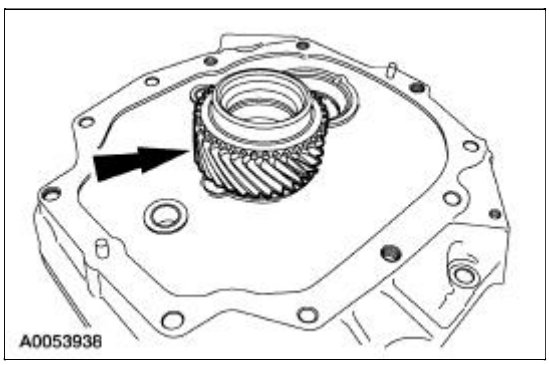
2. Attach the transmission adapter plate to the special tool.

3. **NOTE:** If a new front input shaft bearing or front countershaft bearing was installed, install new bearing cups.

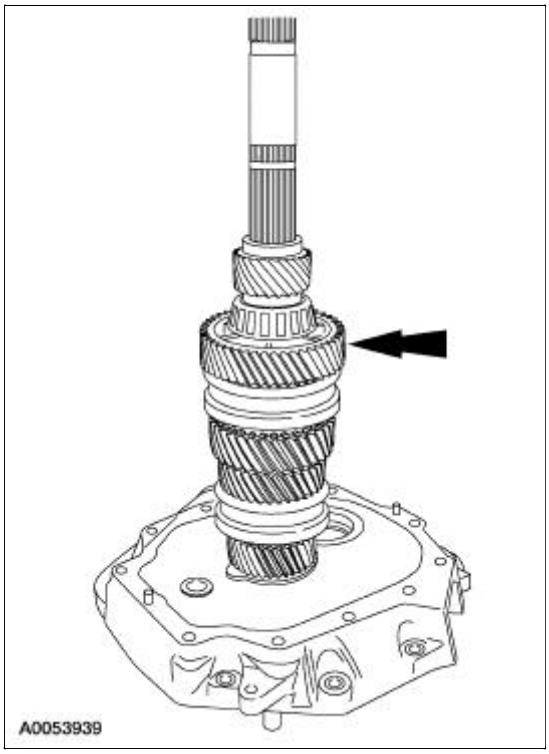
   Install the input shaft bearing cup and the countershaft bearing cup. Do not install the shims at this time.



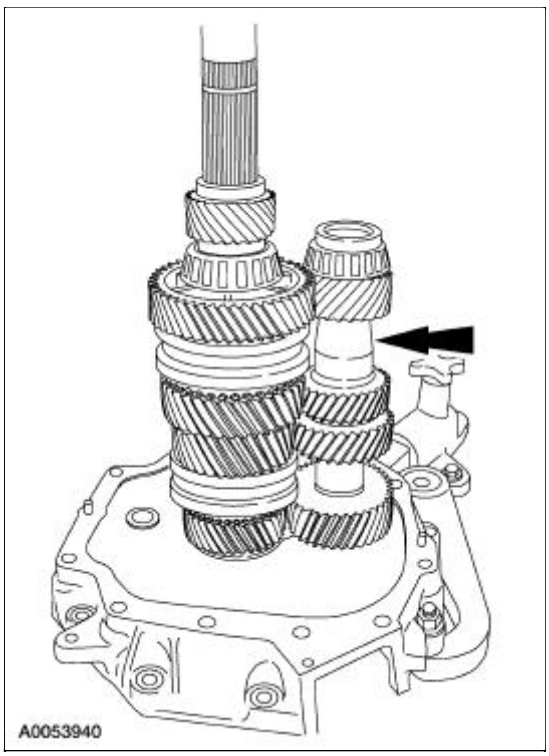
4. Install the input shaft.



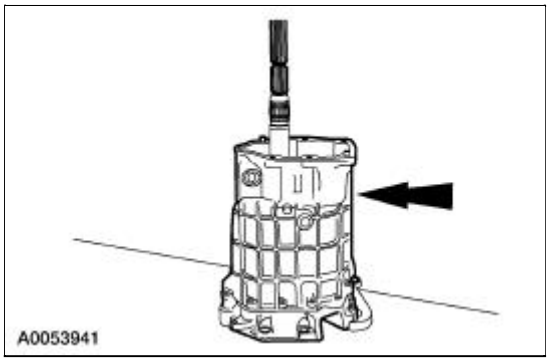
5. Install the mainshaft onto the input shaft.

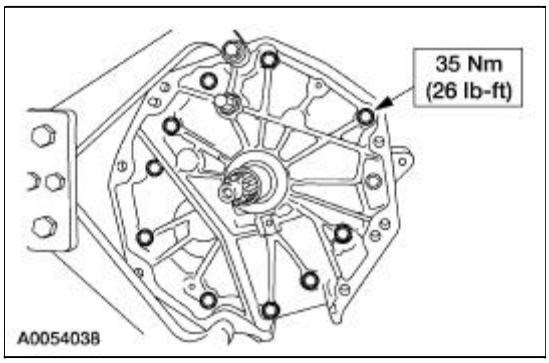


6. Install the countershaft.
    - Lift the mainshaft upward, tilt the countershaft and install.



7. Install the transmission case and tighten the bolts.

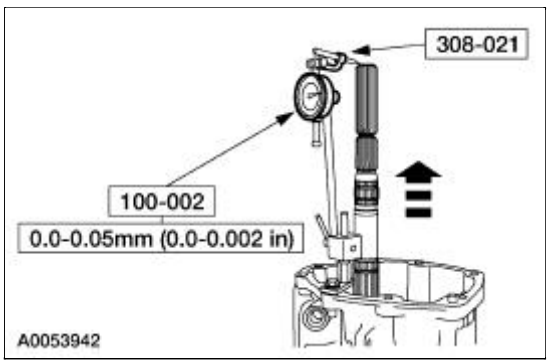




8. **NOTE:** Rotate the transmission so that the input shaft is pointing downward.

   NOTE: Rotate the input shaft/mainshaft to seat the bearings.

   Using the special tools, measure the input shaft/mainshaft end play by applying an upward load on the input shaft. Record the measurement.

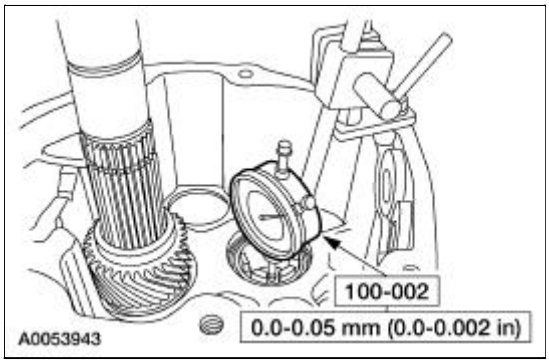


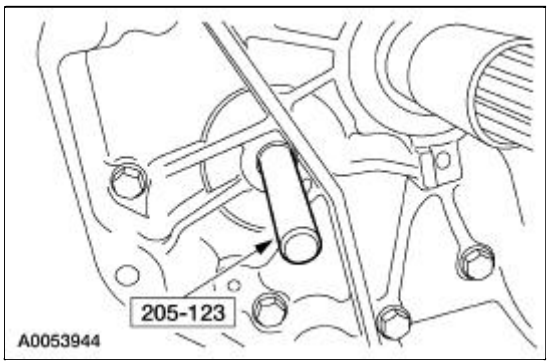
9. Reposition the special tool on the countershaft. Place the tip of the dial between the fingers on the countershaft.

10. **NOTE:** Rotate the countershaft to seat the bearings.

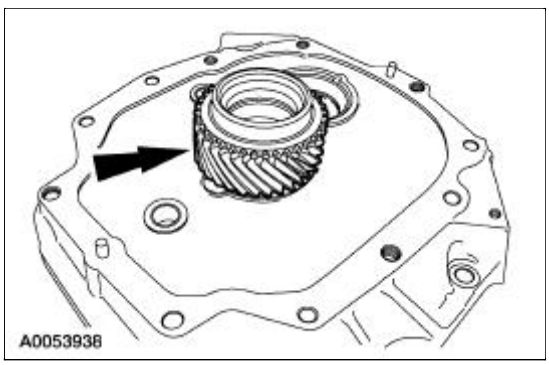
    Using the special tools, measure the countershaft gear end play by pushing upward on the countershaft. Record the measurement.

    - Unscrew the installer from the handle. Insert the handle into the adapter plate plug hole.

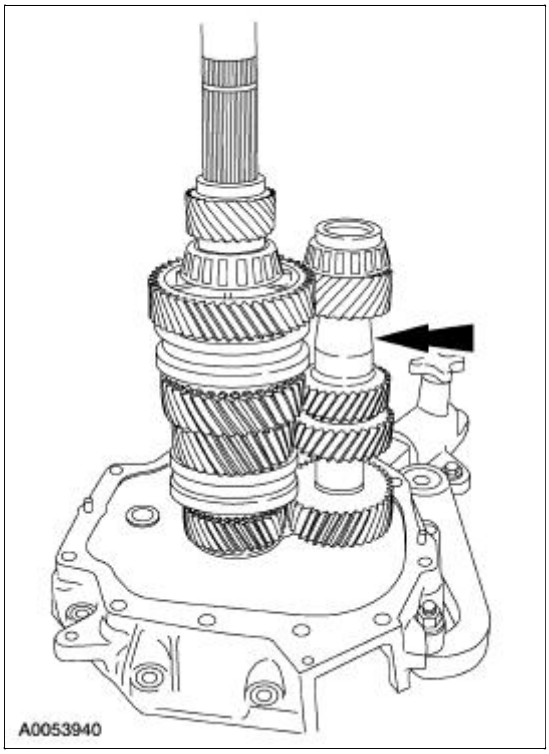




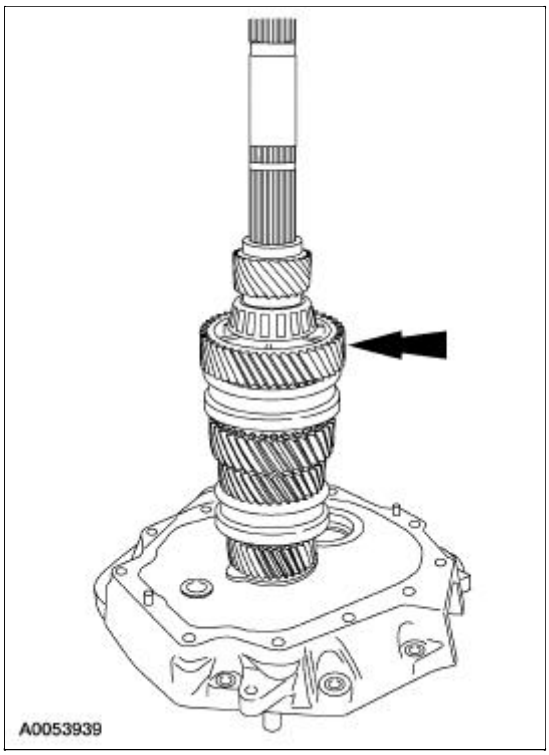
11. Remove the bolts and the transmission case.



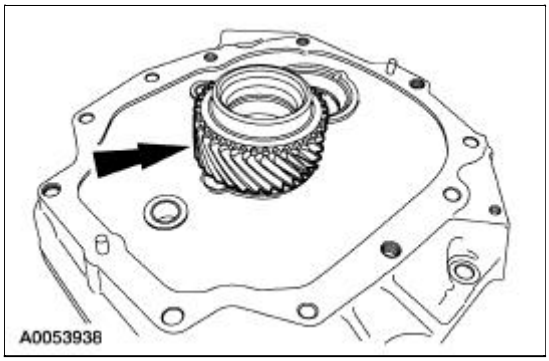
12. Remove the countershaft.



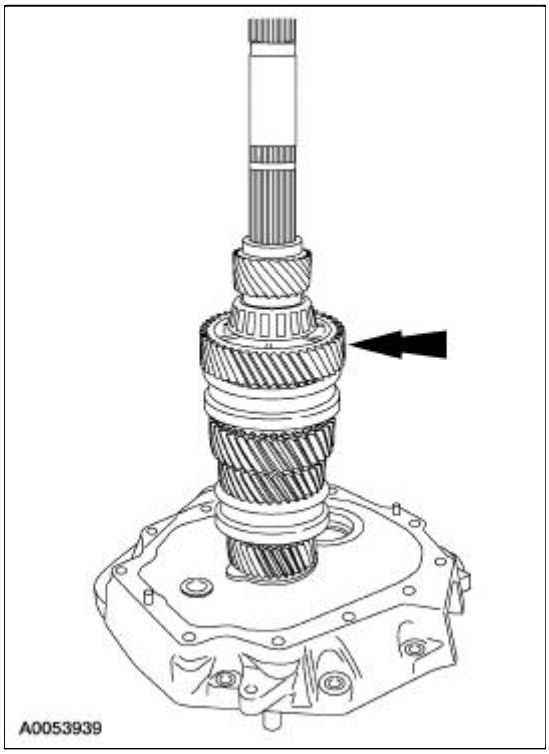
13. Remove the mainshaft.



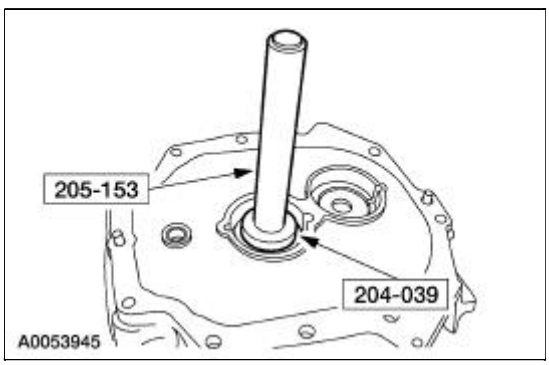
14. Remove the input shaft.



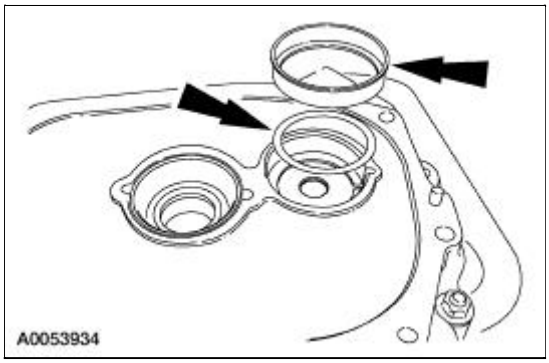
15. Remove the input shaft bearing cup and the countershaft bearing cup.

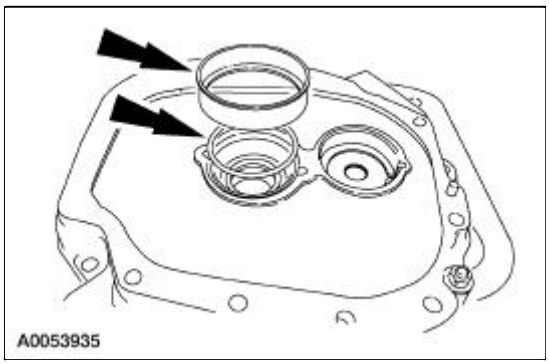


16. Using the special tools, install the new input shaft seal.

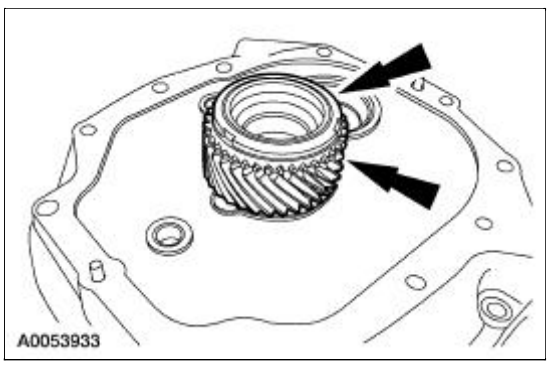


17. Using the recorded end play measurements, select and install the appropriate shims to achieve the proper end play. Install the front input shaft bearing cup and the front countershaft bearing cup.
    - Lubricate the bearing cups with petroleum jelly.

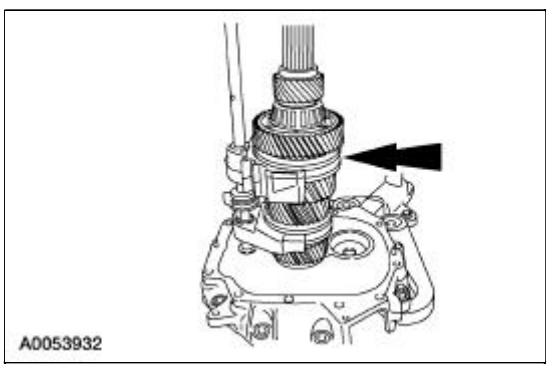




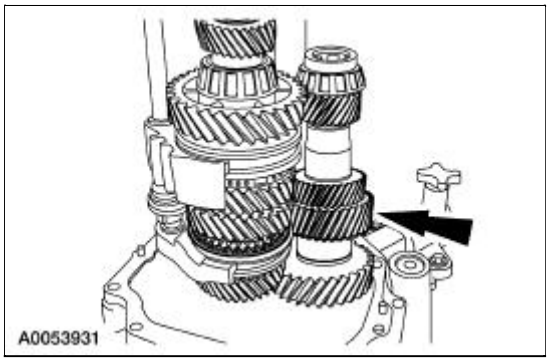
18. Install the input shaft and fourth gear synchronizer blocking ring.



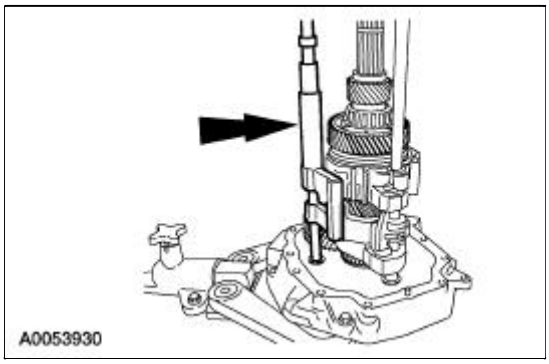
19. Assemble the shift rail assembly to the mainshaft, then install the mainshaft and shift rail as an assembly.
    - Rotate the mainshaft to engage the fourth gear synchronizer blocking ring with the synchronizer keys.



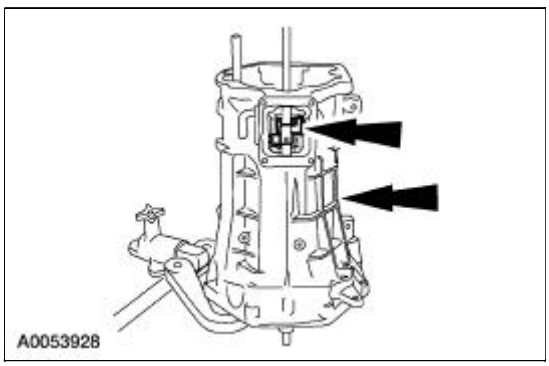
20. Lift up the mainshaft, then install the countershaft.

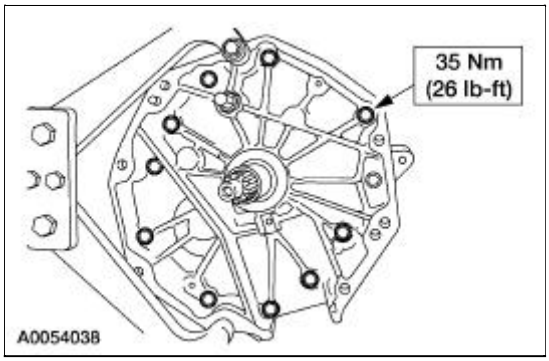


21. Install the fifth/sixth and reverse shift rail assembly and align the slots of the shift levers with the shift interlock plate.

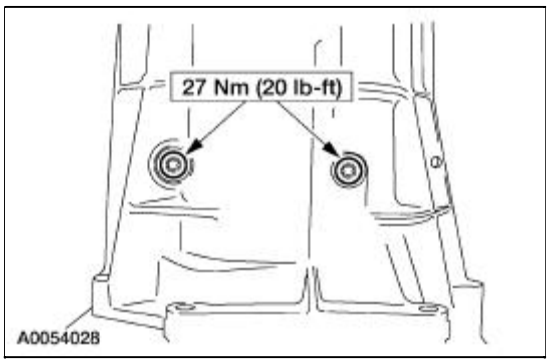


22. Clean the mating surfaces of the transmission main case and the transmission adapter plate. Apply a bead of silicone rubber to the sealing surface on the transmission adapter plate. Install the spring and detent ball into the front offset lever, then install the transmission case and the front offset lever.
    - Make sure the transmission is in neutral to keep the third/fourth gear shift rail from engaging.
    - Compress the front offset lever against the guide plate when installing.
    - Tighten the bolts in a star pattern.

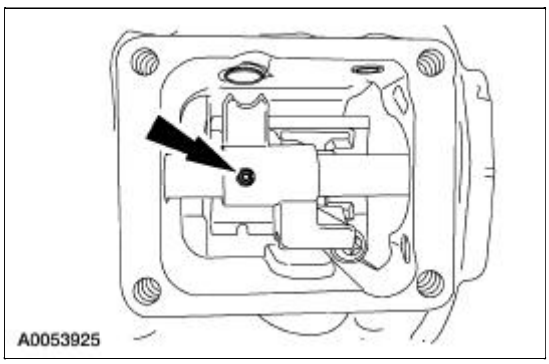




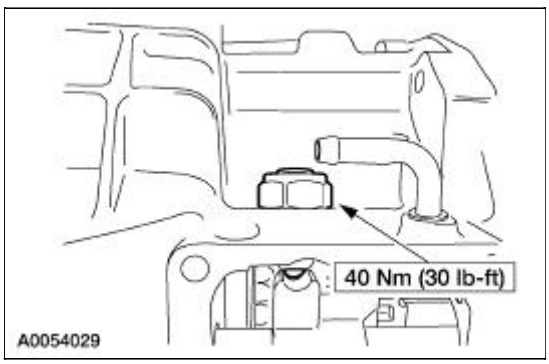
23. Apply threadlock and sealer to the threads of the shift lever guide bolts, then install the bolts.
    - Pull up on the fifth/sixth shift rail to align the slot of the interlock plate with the guide bolt hole.



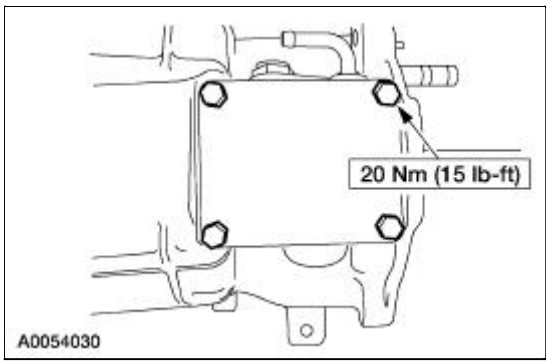
24. Install a new front offset lever roll pin.
    - Install the pin until it is flush with the lever.



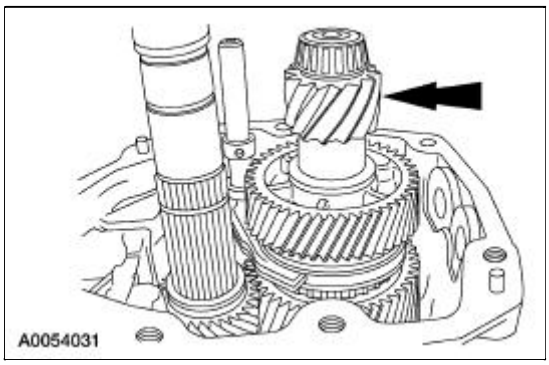
25. Apply threadlock and sealer to the threads of the shift dent, then install the shift detent assembly.



26. Clean the mating surfaces of the transmission main case and the shift detent cover. Apply a bead of silicone rubber to the sealing surface on the transmission case. Install the cover and tighten the bolts.

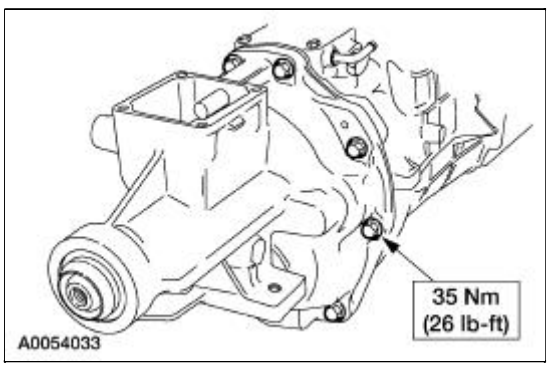


27. Rotate the transmission to a horizontal position. Install the countershaft extension assembly and the fifth/sixth gear shift fork. Make sure the splines are fully engaged.



28. **NOTE:** Remove the countershaft extension shim from the extension housing.

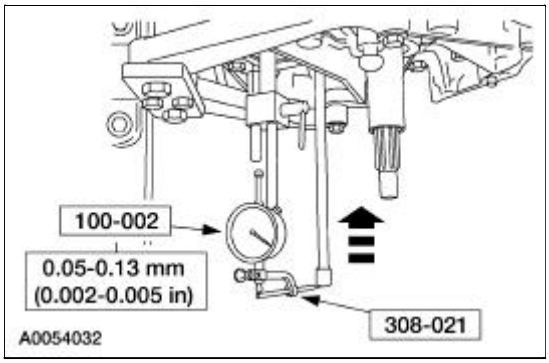
    Install the extension housing and tighten the bolts.



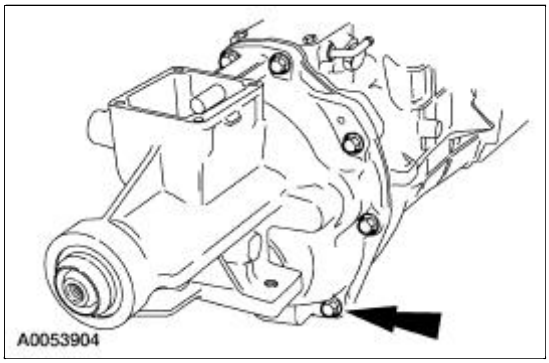
29. **NOTE:** Rotate the transmission to the vertical position.

    Using the special tools, measure the countershaft extension end play by pushing upward on the countershaft extension. Record the measurement.

    - Insert a suitable bar into the adapter plate plug hole until it engages the countershaft extension.



30. Remove the extension housing.

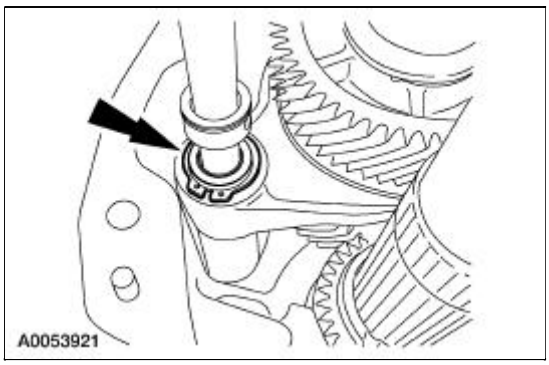


31. **NOTE:** If a new countershaft extension bearing was installed, install a new bearing cup.

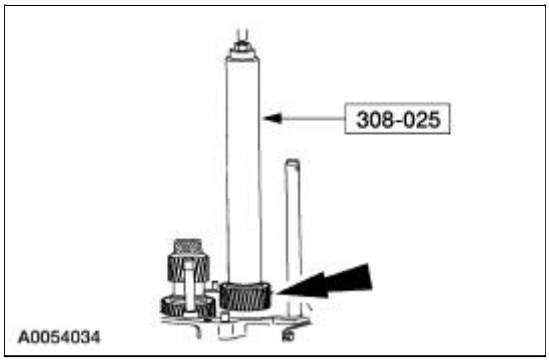
    Using the recorded end play measurement, select and install the appropriate shims to achieve the proper end play. Install the countershaft extension bearing cup.

    - Lubricate the bearing cup with petroleum jelly.

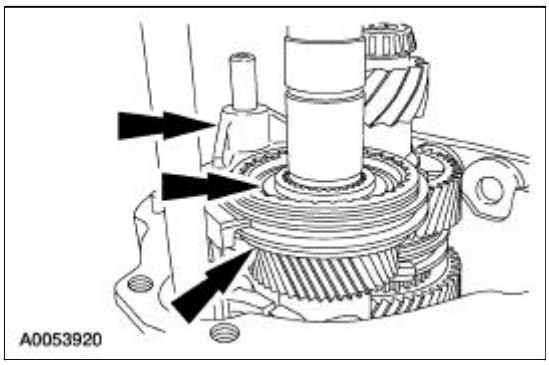
32. Install the fifth/sixth shift fork snap ring.



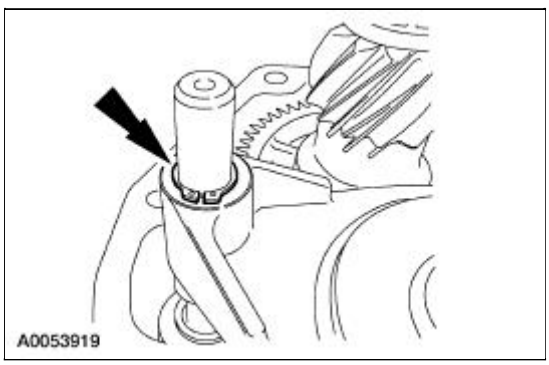
33. Using the special tool, press the fifth/sixth driven gear.
    - Align the splines of the fifth/sixth driven gear with the drive gear on the countershaft extension.



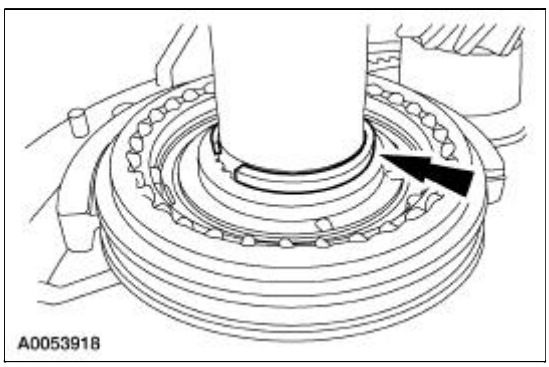
34. Install the reverse shift fork, the reverse synchronizer and the thrust washer as an assembly.
    - Align the pockets in the blocking ring with the struts in the synchronizer.



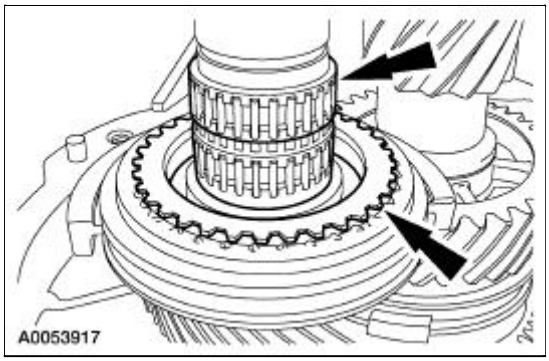
35. Install the reverse shift fork snap ring.



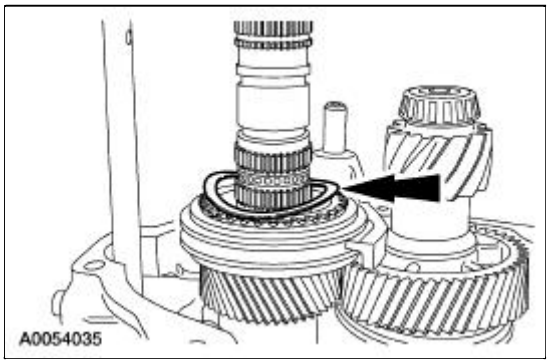
36. Install a new reverse gear synchronizer snap ring.



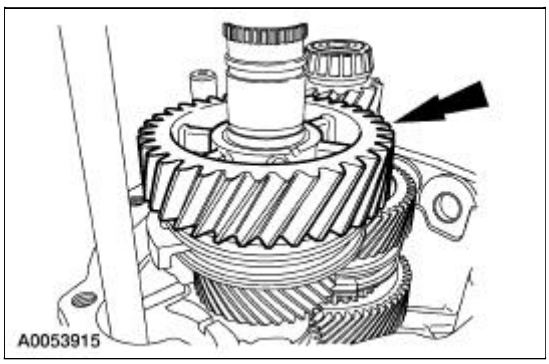
37. Install the reverse gear needle bearing and the reverse gear synchronizer blocking ring.



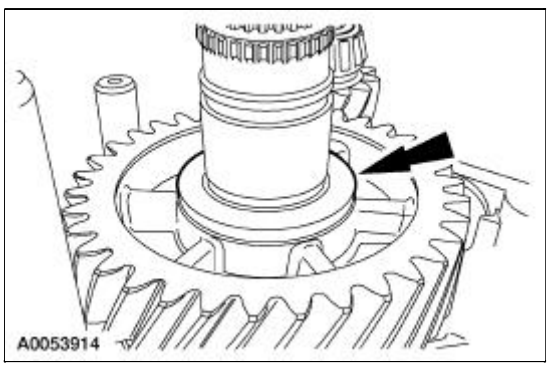
38. Install the reverse gear wave washer.



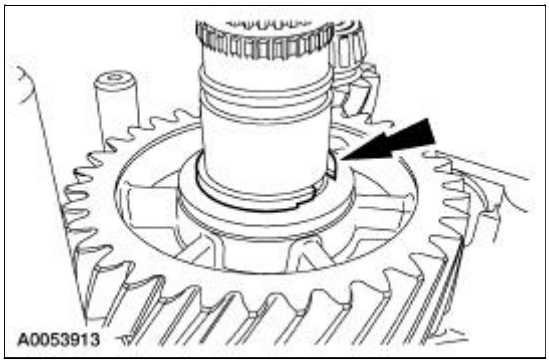
39. Install reverse gear.



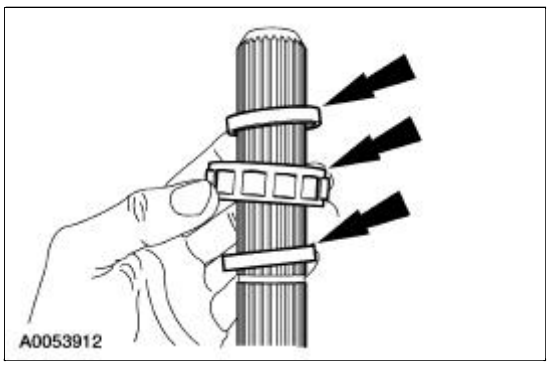
40. Install the reverse gear thrust washer.



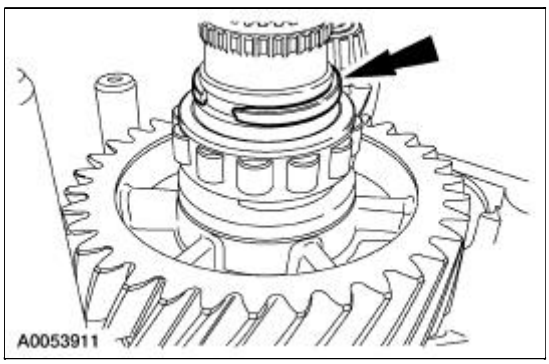
41. Install a new reverse gear snap ring.



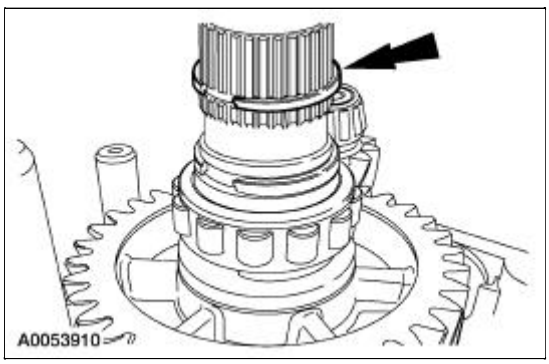
42. Install the lower spacer, the rear mainshaft roller bearing and the upper spacer.



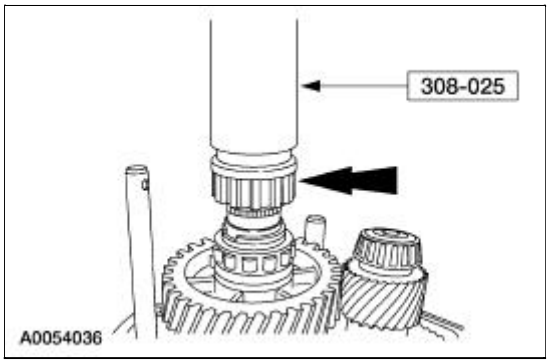
43. Install the rear mainshaft roller bearing snap ring.



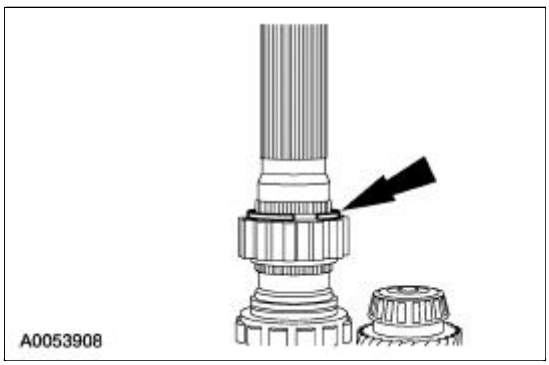
44. Install a new output speed shaft (OSS) sensor tone wheel lower retaining ring.



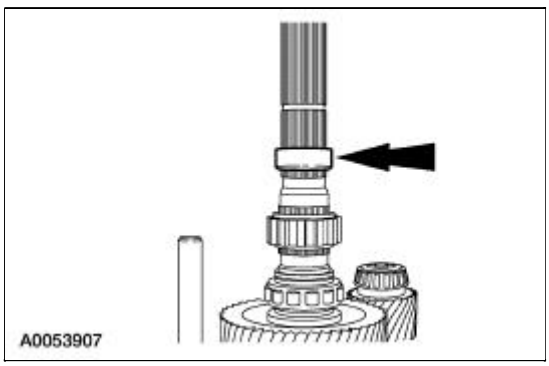
45. Using the special tool, install the OSS sensor tone wheel.



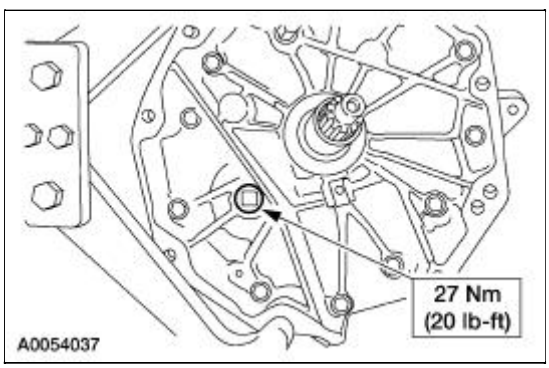
46. Install a new OSS sensor tone wheel retaining ring.



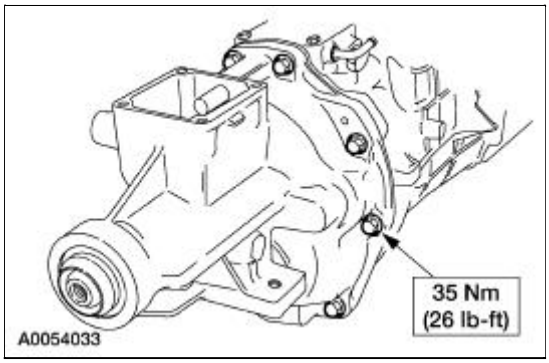
47. Install the shipping seal.



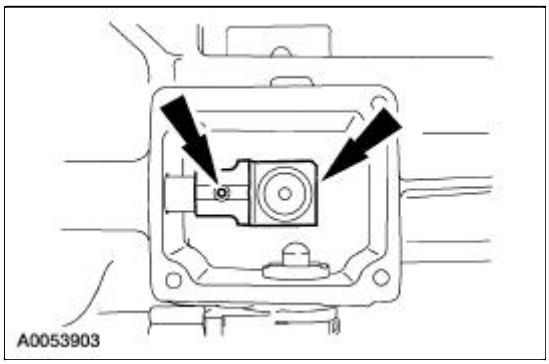
48. Apply threadlock and sealer to the threads of the plug, then install the plug into the transmission adapter plate.



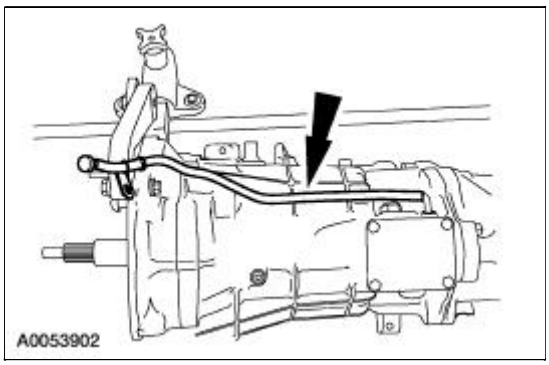
49. Clean the mating surfaces of the transmission main case and the extension housing. Apply a bead of silicone rubber to the sealing surface on the transmission case. Install the extension housing and tighten the bolts.



50. Install the rear offset shift lever, then install a new roll pin.
    - Install the pin until it is flush with the lever.

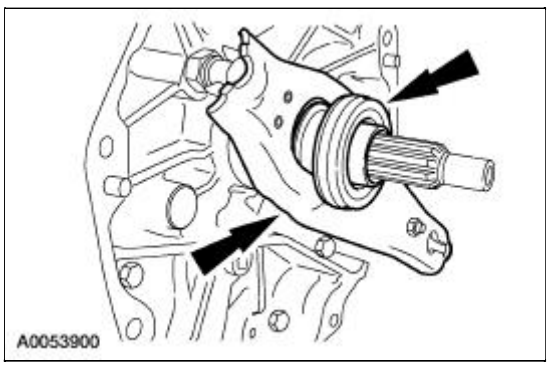


51. Install the vent hose.



52. **NOTE:** Before installing the transmission, the ball stud, the clutch release lever and the input shaft guide tube must be cleaned and lubricated.

    Install the clutch release lever and the clutch release hub and bearing.



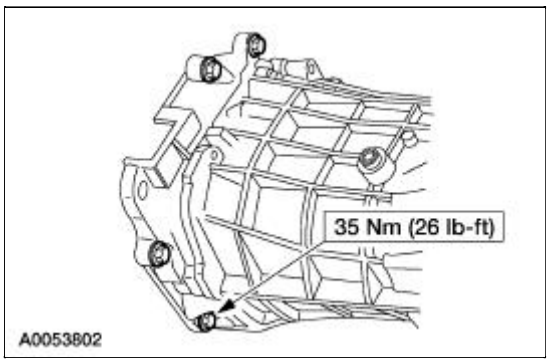
Transmission

Material

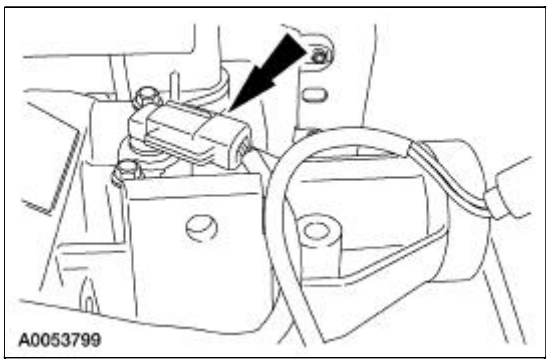
Item	Specification
DEXRON III® (ATF) Transmission Fluid XT-2-QDX or equivalent	DEXRON III®
Pipe Sealant with Teflon® D8AZ-19554-A or equivalent	WSK-M2G350-A2
Premium Long Life Grease XG-1-C, K or T or equivalent	ESA-M1C75-B

1. **NOTE:** Before installing the transmission, the ball stud, clutch release lever and the input shaft must be cleaned and lubricated with grease.

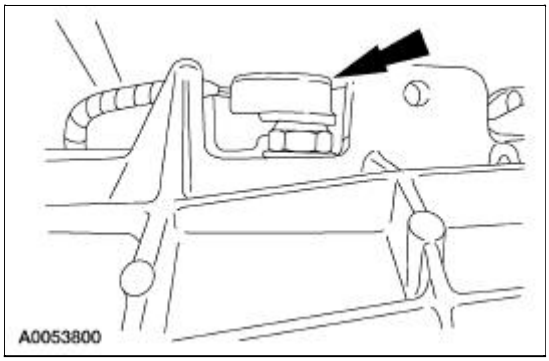
   Position the transmission to the clutch adapter housing. Install the eight transmission-to-clutch adapter housing bolts.



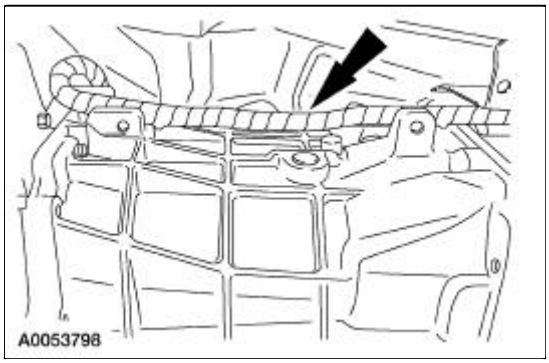
2. Connect the output shaft speed (OSS) sensor electrical connector.



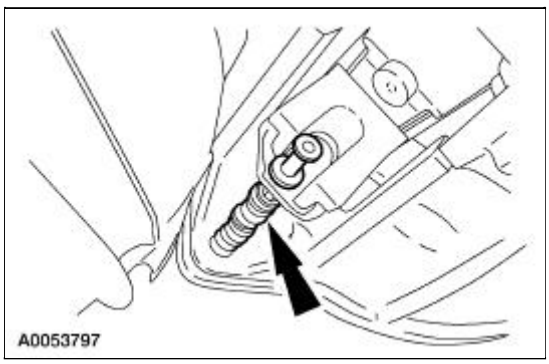
3. Connect the reverse lamp electrical connector.



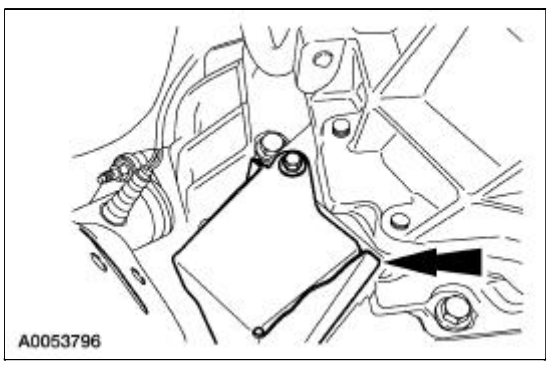
4. Connect the wiring harness to the transmission.



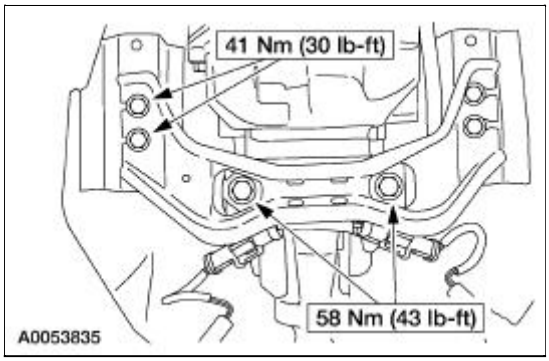
5. Connect the clutch release cable to the clutch release fork.



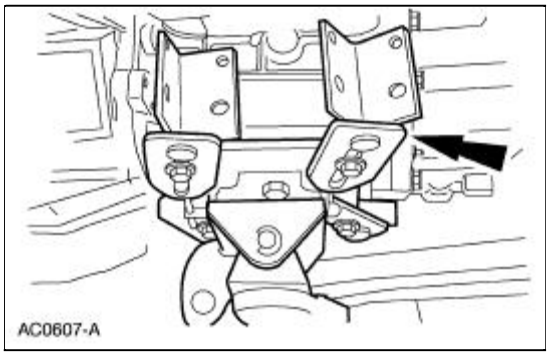
6. Install the clutch release lever cover and bolt.



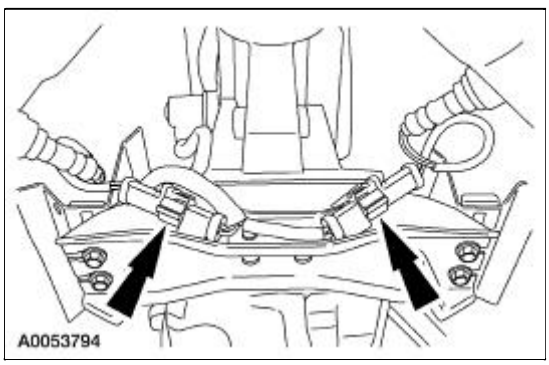
7. Install the transmission crossmember and the bolts.



8. Remove the transmission jack from the transmission.



9. Connect the heated oxygen sensor (HO2S) electrical connectors to the crossmember.



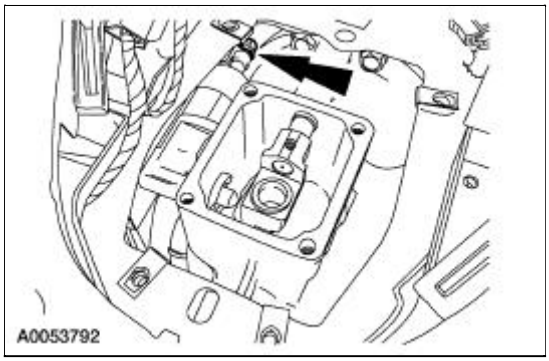
10. **CAUTION: Align the index marks on the driveshaft flange and pinion flange, and the driveshaft slip yoke and transmission output shaft.**

    Install the driveshaft. For additional information, refer to Section 205-01 .

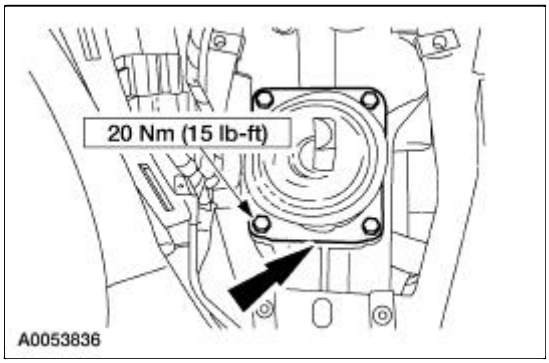
11. Fill the transmission to capacity with the specified transmission fluid. Apply sealant to the fill plug threads and install the fill plug.
    - The total fill capacity is 3.9L (4.1 qt).

12. Lower the vehicle.

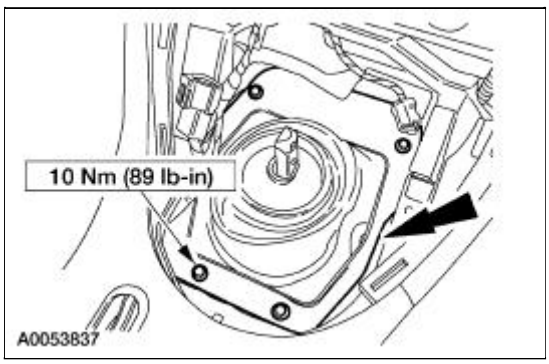
13. Connect the reverse lockout solenoid electrical connector.



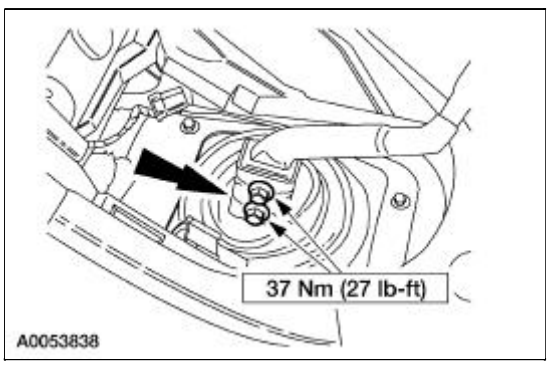
14. Install the lower gearshift lever and the bolts.



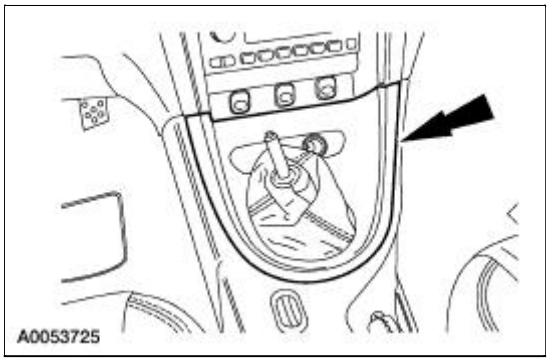
15. Install the lower gearshift lever boot and the bolts.



16. Install the upper gearshift lever and the bolts.



17. Connect the cigar lighter electrical connector. Install the console panel gearshift plate.



18. Install the gearshift lever knob.